Aalto University
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“THIS PROJECT IS OURS!”

Development of collective psychological ownership in the context of self-organising, inter-organisational teams

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Maria Lehto
Aalto University School of Business
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Author Maria Lehto

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Abstract

Collective psychological ownership (CPO) has several beneficial outcomes in organisational context including increased team performance and project outcomes, so understanding the development and possible ways to facilitate it is likely to be in interest of managers. The previous research suggests that a self-organising environment facilitates the development of CPO, while the inter-organisational context is likely to hinder the development of it. The aim of this research is to gain more understanding on development of CPO towards a software development project in self-organising, inter-organisational teams. Interest lies also in understanding how this process could be facilitated by the surrounding organisation(s).

The research was performed as a single embedded case study in a middle sized software development company in Finland. The research relies mainly on qualitative data, for which the main source was semi-structured interviews. Secondary qualitative data sources were employee training materials and team meeting observations. The analysis method for qualitative data was thematic analysis. Additionally, a small quantitative survey was performed relying on pre existing psychological ownership measurement scales. While the majority of the research participants represent the case company, two client company representatives were also included in the sample.

The results confirm that self-organising strengthens CPO while inter-organisational context can potentially hold back the development of it substantially. The results indicate that team autonomy and team members' ability to widely contribute to the ongoing project are crucially important for development of CPO and that facilitation of these is a powerful way to support CPO. Furthermore, the results of this research highlight the special needs of inter-organisational teams in terms of CPO, underlining the need for truly accepting each other as part of the same team as well as acknowledging the sensitive interpersonal dynamics within the team. Both of the above contribute to trust creation and enable open and ongoing communication, which are essential for the development of CPO. As a result of this research, five steps contributing to development of CPO were identified to guide the team members' and the surrounding organisation(s) efforts in facilitation of CPO.

Keywords collective psychological ownership, self-organising teams, inter-organisational teams, software development teams

Tekijä Maria Lehto

Työn nimi "TÄMÄ PROJEKTI ON MEIDÄN!" - Kollektiivisen omistajuuden kokemuksen kehittyminen itseohjautuvissa, yli organisaatiorajojen koostetuissa tiimeissä

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Tiivistelmä

Kollektiivisella omistajuuden kokemuksella (englanniksi "collective psychological ownership" eli CPO) on organisaatioiden kontekstissa lukuisia suotuisia vaikutuksia mukaan lukien tiimin parempi suorituskyky ja projektin paremmat lopputulokset, joten sen kehityksen ja fasilitoinnin ymmärtäminen on johtajille tärkeää. Aiempi tutkimus osoittaa, että itseohjautuvuus tukee CPO:ta kun taas yli organisaatiorajojen tehtävä työ voi mahdollisesti estää sen kehittymistä. Tämän tutkimuksen tavoitteena on lisätä ymmärrystä CPO:n kehittymisestä ohjelmistokehitysprojekteja kohtaan itseohjautuvissa, yli organisaatiorajojen toimivissa tiimeissä. Huomion kohteena ovat myös ne tavat, joilla tiimiä ympäröivät organisaatiot voisivat tukea CPO:n kehittymistä.

Tutkimus tehtiin tapaustutkimuksena keskikokoisessa suomalaisessa ohjelmistokehitysyrityksessä. Tutkimuksessa käytettävä aineisto on pääosin laadullista ja pääasiallisena aineistolähteenä ovat puolistrukturoidut haastattelut. Toissijaisia laadullisen aineiston lähteitä ovat työntekijöiden koulutusmateriaalit sekä tiimien tapaamisten observointi. Lisäksi, suppea määrällinen tutkimus toteutettiin pohjautuen aiemmin kehitettyihin omistajuuden kokemusta mittaaviin kysymyspatteristoihin. Kohdeyrityksen edustajien lisäksi kaksi asiakasyritysten edustajaa sisällytettiin otokseen.

Tutkimuksen tulokset vahvistavat käsityksen siitä, että itseohjautuvuus tukee CPO:ta kun taas yli organisaatiorajojen kootut tiimit saattavat estää CPO:n kehittymistä merkittävästi. Tulosten mukaan tiimin autonomia ja tiimin jäsenten mahdollisuus merkittävästi vaikuttaa projektiin ovat oleellisessa roolissa CPO:n kehityksessä ja näiden fasilitoiminen on tehokas tapa tukea CPO:ta. Lisäksi tutkimustulokset korostavat yli organisaatiorajojen toimivien tiimien erityistarpeita mitä tulee CPO:n kehittymiseen, painottaen erityisesti sen tärkeyttä, että tiimin jäsenet todella hyväksyvät toisensa osaksi samaa tiimiä sekä sitä, että huomiota tulisi kiinnittää herkkään tiimin jäsenten väliseen dynamiikkaan. Molemmat edellä mainitut asiat vaikuttavat luottamuksen rakentumiseen sekä mahdollistavat avoimen ja jatkuvan kommunikaation, jotka ovat ensiarvoisen tärkeitä CPO:n kehitykselle. Tutkimuksen tuloksena tunnistettiin viisi CPO:hon vaikuttavaa askelta, jotka voivat tukea tiimin jäsenten ja niitä ympäröivien organisaatioiden pyrkimyksiä tukea CPO:n kehitystä.

Avainsanat kollektiivinen omistajuuden kokemus, itseohjautuvat tiimit, yli organisaatiorajojen koostetut tiimit, ohjelmistokehitystiimit

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1 Introduction

The aim of this research is to gain more understanding on the development of collective psychological ownership (CPO) in the context of self-organising, inter-organisational teams. More specifically, the focus of this study lies on development of CPO towards an ongoing software development project and the possible ways in which this process could be facilitated. Collective psychological ownership is defined by Pierce & Jussila (2010, p. 811) as ”a collectively held sense (feeling) that this target of ownership (or a piece of that target) is collectively ‘ours.’ ”

CPO is meaningful as a research topic because it has been shown to have several positive effects on team performance (Avey, Avolio, Crossley, & Luthans, 2009; Gray, Knight, & Baer, 2020; Pierce & Jussila, 2010; Pierce, Kostova, & Dirks, 2001), leading to superior results as a team and increased competitive advantage at the organisational level. Furthermore, Verkuyten & Martinovic (2017) point out that through its significant behavioral consequences, CPO is an important construct to be considered in several different group settings. CPO is especially important for agile organisations counting on independent work teams, as employees are expected to have an entrepreneurial drive and take ownership of their team’s goals and performance (Aghina et al, 2018; Hoda & Murugesan, 2016; Pierce, Jussila, & Li, 2018). Fortunately, as Pierce & Jussila (2010) acknowledge, teamwork offers a good ground and opportunities for the development of CPO.

Furthermore, based on the previous research on employee performance and wellbeing, psychological ownership seems to have several connections to desirable psychological states such as increased drive (Hakanen & Perhoniemi, 2012) and increased motivation (Gagne & Deci, 2005). In fact, it seems that dimensions of intrinsic motivation defined in the self-determination theory by Ryan and Deci (2000) are very close to the dimensions of psychological ownership. As CPO is also believed to have several benefits for individual wellbeing (Pierce & Jussila 2010), being better able to facilitate and support the development of CPO is likely to contribute to wellbeing at work as well.

This study is conducted as a single embedded case study, focusing on the support team (ST) and three different project teams within the case company. The case company is a private middle sized organisation in Finnish software development sector and has been selected for the study based on its low hierarchy organisational structure and strong use of self-organising teams. The case company widely relies on agile software development methodologies such as Scrum and has a strong interest in developing employees' CPO. Majority of the software development projects done by the case company are inter-organisational in nature, bringing together client representatives and possible third parties in addition to the case company employees. The case company aims to offer digital solutions for their clients, combining strategy, design and development. In these projects, most of the case company employees are in developer or designer roles.

As the development and facilitation of CPO has been identified as a challenge by the case company, this study aims to provide a clearer understanding on development of CPO and concrete suggestions on how the ST could better facilitate the development of it. Since the focus of this study is on what the ST can do in order to facilitate CPO in teams, it could be said that the study is conducted from a managerial perspective. The case company identifies all management activities, including HR and top management as well as some of the senior developers to be part of the ST.

The case company strongly relies on agile self-organising teams, which have been widely adopted in software development companies around the world (Dames, 2017; Parker, Holesgrove, & Pathak, 2015). In fact, the agile way of organising has its roots in the area of software development (Beck et al, 2001; Stray, Moe, & Hoda, 2018; Takeuchi & Nonaka, 1986). As CPO increases group level learning, open communication and assuming an active role in group responsibilities (Pierce & Jussila, 2010) and these are among the requirements for a well functioning self-organising teams (Stray et al, 2018, Parker et al, 2015), CPO seems to be an important factor for high performing self-organising teams. Hoda & Murugesan (2016) support this by pointing out that in self-organising agile teams, taking ownership of the development project as a team is expected. Self-organising teams have been identified to have the most potential in complex and dynamic environments (Guzzo & Dickson, 1996; Parker et al, 2015; Richter, Dawson, & West, 2011), for which the software development sector provides good ground. Furthermore, the focus on active

facilitation of CPO answers the self organising teams' need for strong supporting functions to reach optimal performance (Parker et al, 2015; Richter et al, 2011).

As self-organising has become a goal for a wide range of organisations also outside of the software development field (Aghina et al, 2018; Malmberg, 2018; Puumala, 2017; Savaspuro, 2019), the results about the development and facilitation of psychological ownership in self-organising teams can be useful for a wider audience as well. It must be kept in mind however, that since there is no one right way to successful self-organising teams (Stray et al, 2018) and since this particular research only focuses on one organisation, the results cannot be widely generalised.

Inter-organisational collaboration on the other hand can be challenging and often reduces the team's autonomy, as identified by the previous research (Conboy & Morgan, 2011; Johnsson, 2018; Moe, Dingsøyr, & Dybå, 2008). This has been clearly recognised as a challenge by the case company as well, since they follow the agile software development practise of having a client representative as Product Owner (PO), forming a part of the self-organising development team (Conboy & Morgan, 2011). Since autonomy is one of the requirements for development of psychological ownership (Pierce et al, 2001), essential for self-organising (Moe et al, 2008; Stray et al, 2018; Takeuchi & Nonaka, 1986) and one of the drivers for intrinsic motivation (Gagne & Deci, 2005), paying attention to the development of CPO in this context is worthwhile and has the potential of facilitating inter-organisational collaboration.

While there is a substantial amount of previous research about psychological ownership on an individual level (Avey et al, 2009; Parker et al, 2015; Pierce et al, 2001; Pierce & Jussila, 2010; Verkuyten & Martinovic, 2017), understanding how organisations could actively facilitate it seems to be limited. Furthermore, a rather limited amount of research has been done about CPO (Pierce & Jussila, 2010; Verkuyten & Martinovic, 2017), especially in the context of self-organising, inter-organisational teams. Stray et al (2018) also note that the understanding of how to effectively support autonomous, agile software development teams is limited. Hence CPO in the context of self-organising,

inter-organisational software development teams presents a research gap worth exploring. Figure 1 below illustrates the research gap.

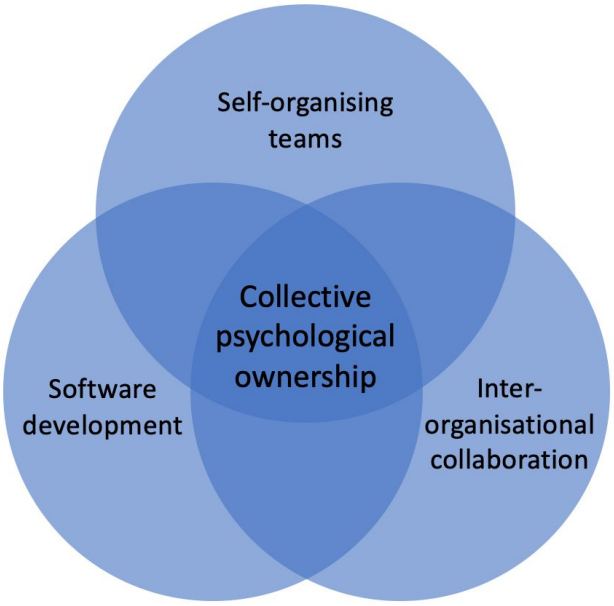

Figure 1, visualisation of the research gap

As the research focus is twofold, the research question is also divided into two parts. Firstly, it is essential to understand how CPO develops in the case company's context. After understanding the development of CPO, it is possible to study different ways in which the development of CPO could be facilitated. The research questions of the study are presented below.

Research questions:

1. *How does project level collective psychological ownership (CPO) develop in self-organising, inter-organisational software development teams?*
2. *How can this process be supported by the case company's support team (ST)?*

This Master's Thesis is divided into six chapters. The introduction chapter has presented the case and justified the research gap. Clear research questions have also been presented.

Chapter two presents the conducted literature review, first building understanding about psychological ownership on an individual and collective level (section 2.1), then proceeds to summarise the previous research about self-organising teams (section 2.2) and inter-organisational teams (section 2.3) which are the two defining context factors for the study. Finally, the above mentioned areas of previous research are brought together in section 2.4, presenting their connections and the theoretical framework of the study.

Chapter three touches on methodology, justifies the selection of the case study approach (section 3.1) and explains the data collection and analysis process in detail (sections 3.2 and 3.3). Validity and credibility of the study are also discussed under section 3.4. Chapter four presents the empirical findings. Quantitative results are presented in section 4.1 and qualitative results in section 4.2 with three subsections according to the main themes identified from the empirical data. In chapter five, the empirical findings are discussed and analysed in relation to the previous research (section 5.1) and as a result, the identified five steps contributing to development of CPO are presented and explained (section 5.2). Finally, chapter six offers concluding remarks, highlights the theoretical contributions (section 6.1) and managerial implications (section 6.2) as well as discusses the limitations of the study (section 6.3). Suggestions for future research are offered in section 6.4.

2 Literature review on psychological ownership, self-organising teams and inter-organisational teams

This chapter presents the different scholarly discussions around the theme of psychological ownership as well as the main context factors: self-organising teams and inter-organisational teams. The literature review on context factors is included to gain deeper understanding on the context in which the case company's teams operate. Furthermore, the section about psychological ownership has been broken down to two sections, focusing on individual and collective levels of psychological ownership separately. This is essential, as understanding about the individual psychological ownership lays a strong foundation for understanding the collective level of it and compared to CPO, has been more widely researched.

As suggested by Eriksson & Kovalainen (2011), understanding the uniqueness of a case is only possible through first understanding the findings of previous studies. Because the phenomenon of CPO is not yet widely researched in this specific context, some newspaper and blog articles have been included in the literature review as well. Including blog posts and newspaper articles also enables focus on the most recent discussion around these topics, as the academic literature is slower to react to new developments in the organisational world. In the end of the chapter, all the different themes are summarised and connections are highlighted in the form of a conceptual framework under section 2.4.

2.1 Psychological ownership - individual and collective level

Individual and collective level psychological ownership have much in common, both having the sense of possessiveness in their core (Pierce & Jussila, 2010). The target of psychological ownership can be almost anything, from physical objects to organisations or ideas (Pierce et al, 2001; Pierce & Jussila, 2010; Pierce, Kostova, & Dirks, 2003). Pierce et al (2001) further elaborate that feelings of ownership have great importance in terms of psychological and behavioral effects and Pierce et al (2003) note that possessions have their role in social interaction as well, as they are used to express self-identity to others.

Although the case study focuses on development and facilitation of psychological ownership on a collective level, the literature review first takes a deep dive into the individual side. It is crucial to gain understanding on the individual level of psychological ownership first, since it is deemed highly unlikely to experience psychological ownership at the group-level if a person does not experience oneself also as a psychological owner at the individual-level (Pierce & Jussila 2010). From this strong foundation it is later easier to understand the development of psychological ownership on a collective level.

2.1.1 Antecedents and development of individual psychological ownership (IPO)

According to Pierce & Jussila (2010) and Pierce et al (2001), psychological ownership is a state of mind in which the individual feels as though the target is theirs, and they are psychologically tied to a target. The sense of ownership has been said to be tied to the psychology of possessiveness, for which humans seem to have an innate need for (Pierce et al, 2001). However, it is emphasised that the legal right of possession is not by far the only way to experience psychological ownership (Pierce et al, 2003; Pierce et al, 2018). Pierce et al (2003) also note that it is possible for an individual to legally own an object without ever feeling psychological ownership towards it.

According to Pierce et al (2003), there seems to be two schools of thought in terms of the background of psychological ownership. Some see possessiveness as an innate need, like an instinct, while others believe that social and cultural aspects play a bigger role in developing the need for possessing. While Pierce et al (2003) conclude that both sides play a role in forming the relations that individuals have with their possessions, they emphasise the role of culture by stating that different cultural backgrounds affect how individuals understand the concepts of self and of possession. Other individual factors such as tenure and personality can also affect the development of psychological ownership (Ozler, Yilmaz, & Ozler, 2008; Pierce et al, 2003).

In the organisational world, psychological ownership of employees has been claimed to be a key to organisational competitiveness (Brown, 1989, as cited in Pierce et al, 2001). This might certainly be true, as Avey et al (2009) supported by Verkuyten & Martinovic (2017)

point out that people tend to value, take better care of, maintain and nurture possessions they own. It has been further suggested by Olckers & Du Plessis (2012) that positively oriented psychological ownership could be used to lower turnover rates and to increase productivity in organisations. Pierce et al (2003) argue that in the organisational context psychological ownership is less likely to emerge if strong control, rigid division and standardisation of labour and strict hierarchy are in place.

According to Pierce et al (2001), the dimensions behind psychological ownership are belonging, self-efficacy, and self-identity. This theory has been developed by Avey et al (2009), adding the dimensions of accountability and territoriality. Avey et al (2009) have identified the first four (belonging, self-efficacy, self-identify and accountability) as promotion oriented aspects and the last one - territoriality - as a prevention oriented aspect. While this research focuses on the emergence and facilitation of promotion oriented collective psychological ownership, it is good to keep in mind the possible negative effects of psychological ownership caused by the territoriality dimension. Pierce et al (2003) point out that the above mentioned dimensions do not directly cause psychological ownership, but rather facilitate the development of it.

Firstly, Self-efficacy means the individual's belief they have the capabilities needed to complete the task (Avey et al, 2009). In other words, as Olckers & Du Plessis (2012) note, being in control forms an important part of self-efficacy. Connected to self-efficacy, Stander & Rothman (2010) point out that individuals fear and avoid situations they believe to exceed their capabilities, which easily leads to paralysation. On the other hand, they note that engaged employees often have high self-efficacy. Interestingly, Verkuyten & Martinovic (2017) suggest that psychological ownership provides a sense of efficacy, suggesting that the cause and effect of these psychological states might be the other way round. Pierce et al (2003) give some clarification to this by explaining that the development of psychological ownership is iterative in nature: feelings of ownership cause the individual to make personal sacrifices on behalf of the target, which then again leads to stronger feelings of ownership.

Secondly, belongingness has been seen as an innate human need that can be satisfied in the organisational context (Avey et al, 2009; Gagne & Deci, 2005; Richter et al, 2011). Pierce et al (2001) further connect the aspect of belongingness to having a "home." Pierce et al (2003) summarise that possessions can serve this purpose and create a sense of security for the individual. They note that to satisfy the belongingness dimension, the target of ownership must be hospitable. Connected to belongingness, it has been identified by Guzzo & Dickson (1996) that team familiarity increases work outcomes to a certain point. Moe et al (2008) on the other hand point out that participation in self-organising teams increases the emotional attachment towards the organisation.

Thirdly, self-identity refers to the target or ownership becoming part of the concept of self (Avey et al, 2009; Pierce et al, 2001; Pierce et al, 2003; Verkuyten & Martinovic, 2017). As Pierce et al (2001) further elaborate, people use ownership to define self and to ensure the continuity of self over time. Pierce et al (2003) point out that while some level of psychological ownership can develop rather quickly, deeply connecting the target of ownership to the sense of self takes time. They also add that on a minimal level, the target of ownership must be visible and attractive to the individual, satisfying the self-identity dimension. Moe et al (2008) point out that challenges may arise in situations that are affected by external demands and autonomy is reduced. They continue that in these kinds of situations individuals are less likely to identify with the target and thus less likely to experience psychological ownership.

The last of the four dimensions, accountability, is divided into two mechanisms by Avey et al (2009): the right to hold others accountable as well as the expectation of oneself to be held accountable by others. Pierce et al (2003) support this by pointing out that responsibility for a target leads to feelings of ownership. They explain that when one feels responsible for a target, they start investing themselves into it through caretaking, energy and concern, eventually contributing to feelings of ownership towards the target.

2.1.1.1 The routes affecting IPO

Three different routes to affecting psychological ownership have been identified by Pierce et al (2001). Firstly, the *ability to control the target* of emerging psychological ownership

is emphasised. According to Pierce et al (2001), the more times one controls the target, the more psychological ownership develops. This is in line with the notion by Olckers & Du Plessis (2012) that being able to have influence and control over objects increases psychological ownership, as it is closely connected to the sense of self-efficacy. It has also been noted that personalisation of space, although often seen as territorial behaviour, could be seen as a way of simultaneously claiming and exercising control over a target (Pierce & Jussila, 2009).

The empirical evidence from previous research by Olckers & Du Plessis (2012) seems to support the connection of autonomy and psychological ownership, through the sense of control. Mayhew et al (2007, as cited in Olckers & Du Plessis, 2012) further explain that as autonomy has such a significant role in attitudes and behaviours towards work, it can be seen as an important factor in job-related psychological ownership. In a bigger picture, Ryan & Deci (2000) acknowledge autonomy to be one of the three innate psychological needs connected to motivation. Pierce et al (2001) further emphasise that to serve the efficacy motive, the target of ownership must be malleable. They also note that lowering hierarchical structures and job crafting can increase the employees sense of control over their work. This view has been supported by Wang, Demerouti, & Le Blanc (2017), claiming that job crafting can play a significant role in maintaining employees' motivation and wellbeing.

Secondly, *coming to intimately know the target* has been said to lead to a fusion between self and the target (Pierce et al, 2001). They explain that the more one has information about the target, the deeper the connection and that, supported by Olckers & Du Plessis (2012), sharing information about the organisation's mission, targets and performance can aid the employees to travel down this route. Pierce et al (2001) and Olckers & Du Plessis (2012) also note that longer tenure in the organisation often leads to gathering more information about the target of ownership. In fact Ozler et al (2008) go as far as suggesting that the longer an employee has worked in an organisation, the stronger ownership they feel towards it.

Lastly, Pierce et al (2001) explain that *investing oneself into the target* in the form of energy, time, ideas or skills, enhances the sense of psychological ownership. They suggest that the more one invests oneself towards the target, the more psychological ownership one feels. This point is backed up by the notion that people tend to feel ownership for the results of their own labour (Pierce & Jussila, 2010; Verkuyten & Martinovic, 2017). In fact, Pierce et al (2003, p. 17) note that "The most obvious and perhaps the most powerful means by which an individual invests him/herself into an object is to create it." This is very much the case in the context of this research, as the case teams are creating new software solutions for their clients. It has also been suggested that non-routine technologies and complex jobs offer a chance to invest oneself into the target through using one's own judgement, thoughts and personal style (Olckers & Du Plessis, 2012).

Tying all the above mentioned three routes together, it has been suggested by Verkuyten & Martinovic (2017) that when an individual is entrusted with the care of an object (i.e., stewardship), they can 1) exercise control over it, 2) can develop intimate knowledge of it and 3) invest in it, leading to gradually developing a sense of ownership. Based on this, it could be said that trust plays an important role in the development of psychological ownership. Pierce et al (2003) conclude that targets that allow traveling down the three above mentioned routes are good candidates for the development of psychological ownership.

There has been some previous research indicating ways in which the development of psychological ownership could be supported by the managers and Olckers & Du Plessis (2012) assure that it is indeed possible to facilitate the development of psychological ownership in organisations. For example, Ghafoor, Qureshi, Khan, & Hijazi (2011) suggest that different employee engagement practices and transformational leadership can help develop a sense of ownership in employees, while Avey et al (2009) argue that psychological ownership can be measured and developed through training in the four positively oriented dimensions of psychological ownership: belonging, self-efficacy, self-identify and accountability. Pierce et al (2003) conclude that all the elements of psychological ownership are interrelated and often reinforce each other. They also underline that although psychological ownership can develop as a result of experiencing

only one of the dimensions or routes, it is likely to be stronger the more of the elements are in place.

2.1.1.2 Psychological and behavioral effects of IPO

According to Pierce et al (2001), different rights and responsibilities follow from psychological ownership. They further underline that feelings of ownership have important effects both on a psychological and behavioral level. For example, Olckers (2013) suggests that enhanced psychological ownership can help organisations to retain talent. Several scholars have also mentioned psychological ownership to play an important role in organisations' performance and effectiveness (Avey et al, 2009; Ghafoor et al, 2011; Olckers, 2013; Olckers & Du Plessis, 2012). Brown (1989, as cited in Pierce et al, 2001) on the other hand suggests boldly that psychological ownership is in fact a key to organisational competitiveness.

As to the above mentioned rights and responsibilities, rights include having a say in decisions concerning the target and having right to information related to the target according to Pierce et al (2001). They also note that responsibilities are numerous, including responsibility to invest time, to nurture, to protect and care and even to personally sacrifice and assume risk on behalf of the target. Connected to the rights, Verkuyten & Martinovic (2017) point out that in addition to indicating what one can do, psychological ownership also defines what others cannot do towards the target. This could be seen to be connected to the possible negative effects of psychological ownership in a form of territorial behaviour (Avey et al, 2009; Pierce et al, 2001).

In addition to enhanced performance in work related tasks, it has been identified that psychological ownership is connected to positive organisational behaviour (Ozler et al, 2008; Pierce et al, 2001) and so called "extra role behaviours", meaning constructive behaviours that are outside of one's immediate responsibilities (Vandewalle, Van Dyne, & Kostova, 1995). Psychological ownership has been also said to be closely connected to organisational commitment (Ozler et al, 2008; Pierce et al, 2001; Vandewalle et al, 1995), experienced responsibility and promoting self-initiated change (Pierce et al, 2003) as well as work engagement (George, 2015; Ghafoor et al, 2011). In addition to these positive

effects for the organisation, Pierce et al (2003) remind that feelings of possession are often pleasure providing per se, contributing to the wellbeing of the individual.

Olckers & Du Plessis (2012) take the analysis on a broader level by explaining that the more an individual is psychologically attached to the target, the more it fulfills the basic human needs of efficacy, self-identity and having a place. These basic human needs have been identified by Ryan & Deci (2000) in the self-determination theory as essential conditions for the flourishing of motivation. It can thus be concluded that psychological ownership is closely connected to increased motivation and all the positive behaviours that follow.

Apart from its numerous positive effects, psychological ownership can also bring challenges. According to Avey et al (2009) and Pierce et al (2001) the negative effects of strong psychological ownership are largely due to the territoriality dimension, which might lead to overly possessive behaviour, such as reluctance to share information. It has also been noted that resistance towards change that is not self-initiated (in other words, imposed change) is greater the more psychological ownership the members of the organisation experience (Pierce et al, 2001). In addition, Pierce et al (2003) note that losing control over the target of ownership can lead to frustration and feeling of personal loss.

While it has been suggested that individual and collective levels of psychological ownership often coexist, it is possible for the team members to experience individual psychological ownership without collective sense of psychological ownership taking root (Gray et al, 2020; Pierce & Jussila, 2010). For collective ownership to emerge, members must share an understanding of owning the target of ownership together (Gray et al, 2020). The next section investigates the mechanisms through which the state of collective psychological ownership can be achieved.

2.1.2 Antecedents and development of collective psychological ownership (CPO)

As presented in the section above, individual psychological ownership develops in different person-object interactions. The development of CPO on the other hand requires

person-object, other-object and person-to-person interactions (Pierce & Jussila, 2010). This notion could be seen to emphasise the need for effective and open communication between the team members. Pierce & Jussila (2010) stress that while CPO is intersubjective in nature, it is an emergent collective phenomenon, a commonly shared understanding of the group. They add that this commonly shared mindset emerges and is transferred in interactive dynamics within the team, through verbal and non verbal communication. The shared understanding of ownership implies that the group has a right to decide how the target of ownership is used and by whom (Verkuyten & Martinovic, 2017). As such, CPO is said to be a collective level variant or an extension of individual level of psychological ownership (Pierce & Jussila, 2010; Verkuyten & Martinovic, 2017).

Verkuyten & Martinovic (2017) highlight that CPO is all about collective self-esteem, collective self-efficacy, and collective self-interests, rather than just focusing on individuals' psychological states as in individual level of psychological ownership. They further note that just as taking care of something that is considered "mine" is experienced as taking care of "myself", taking care of something that is "ours" symbolises taking care of "ourselves". Along these lines, and as mentioned before, the definition of CPO used in this research comes from Pierce & Jussila (2010, p. 811): "a collectively held sense (feeling) that this target of ownership (or a piece of that target) is collectively 'ours.'"

Pierce & Jussila (2010) suggest that in the background of CPO, an individual level psychological ownership must exist first. They continue that as CPO is a socially constructed state, individuals ought to recognise that others feel ownership for the target as well and switch their perspective from "mine" to "ours" through communication with others. For this part of the process, as Pierce & Jussila (2010) note, history of the group plays a big role as this shift in perspective is easier to achieve if the team members have a history of being frequently and consistently active in each other's presence. Finally, the target of ownership is accepted as part of the team's extended self. Pierce & Jussila (2010) highlight that CPO is strongest when all members recognise "us" and the target being "ours" and that CPO is more likely to develop when team members as individuals have collectivist values.

According to Pierce & Jussila (2010), all of the routes affecting individual level psychological ownership (ability to control the target, coming to intimately know the target and investing oneself into the target) also affect the development of CPO and must be travelled down together as a group. The more the team members have travelled down these routes (independently and together), the stronger the CPO (Pierce et al, 2001). Pierce & Jussila (2010) also note that the more opportunities the team has for self management, for example choosing team members, direction, ways of working and so forth, the more they are able to travel down these routes and to develop CPO. They point out that to make effective decisions as a team, all of the team members need to have plenty of information about the target. This on the other hand contributes to the team *coming to intimately know the target.* Pierce & Jussila (2010) also note that learning each other's tasks and roles - as is expected in self-organising teams (Morgan, 1986, as cited in Hoda & Murugesan, 2016) - also helps in development of CPO through coming to recognise the collective effort invested in the target and that task interdependence also contributes to traveling down the three routes together as a team.

Just as in the individual level of psychological ownership, the target factors play a role in the development of CPO. Pierce & Jussila (2010) point back to the research by Pierce et al (2003) and summarise that for a collective level psychological ownership to emerge, the target needs to be jointly accessible and malleable (to satisfy the collective efficacy need), jointly attractive and socially esteemed (to satisfy the identity need) and jointly available and hospitable (to provide a "home" to the team). Pierce & Jussila (2010) further note that the target's meaning should be collectively understood and it should involve a visible and collaborative working relationship.

2.1.2.1 Boundary conditions needed for the development of CPO

Although individual and collective psychological ownership are relatively close to each other, there are some aspects only affecting the development of CPO. According to Pierce & Jussila (2010), these include (task)interdependence, collective identification, and team

chemistry and cohesiveness. Fortunately, as they explain, teamwork provides a possibility for fulfillment of these boundary conditions.

In terms of task interdependence, Pierce & Jussila (2010) note that CPO is more likely to develop if the project at hand requires team members to work together and tasks are closely connected and dependent on other team members' tasks. Pointing to previous literature, they suggest that similar effects can occur if individuals' goals are tightly coupled with other's goals as well as the common goals of the team and when feedback and rewards are given to the team as collective. According to Pierce & Jussila (2010), interdependence also facilitates traveling down the routes of ownership on a collective level. However, they stress that interdependence alone is not enough and that a high level of task interdependence can exist without CPO taking root.

Related to the boundary condition of collective identification, Pierce & Jussila (2010) note that as a need for social identity plays a significant role in the development of CPO, the target of ownership should satisfy the social identity motive, meaning the importance of being part of the group. This could be seen to be connected to the belongingness dimension of the individual level identified in the earlier sections by Pierce et al (2001). To elaborate the condition of collective identification, Pierce & Jussila (2010) stress that for an individual to claim something as "ours", they must first identify themselves and want to be identified as part of the group - "us." In other words, as they explain, if one does not like the group, they will not participate in claiming the target as "ours."

Pierce & Jussila (2010) remind however that just like with the interdependence condition, collective identification alone is not enough to form CPO, but at least one of the individual level psychological ownership motives (such as self-efficacy or belongingness) needs to be in place as well. This supports the notion presented before that for CPO to develop, individuals must feel ownership towards the target first. Pierce & Jussila (2010) further note that it is not enough if only one person of the team identifies as part of the collective, but the whole group needs to be aware of its existence, and that the more familiar the team members are with each other from the past, the more likely they are to identify themselves as part of the team.

Team chemistry and cohesiveness is the third boundary condition recognised by Pierce & Jussila (2010). They suggest that CPO is more likely to develop if the team members spend time together and get to know each other and add that high task interdependence facilitates this process. Through this interpersonal bonding, Pierce & Jussila (2010) suggest, each team member develops a complex understanding, acceptance and respect of each other's abilities and roles. They explain that in this kind of situation, each team member will readily make personal sacrifices in order to reach the common goals. Pierce & Jussila (2010) also note that team chemistry is connected to the team members feeling attracted to the group and wanting to remain a part of it.

In addition to the above mentioned boundary conditions by Pierce & Jussila (2010), some other connections to CPO have also been identified. For example, previous research by Ng & Su (2018) has found significant connections between different individual background variables and CPO, such as job tenure and position, hours of work per week, job demands, job resources, and organisational size. They suggest that the connection to high job demands could be due to more and bigger experiences of achievements. This could be seen to be connected to self-efficacy. According to Ng & Su (2018), higher position and longer tenure seem to be connected to higher CPO as well, which could be argued to have a connection with the route of coming to intimately know the target. Ng & Su (2018) also note that getting a reasonable compensation for the work and having overall high job resources are connected to higher CPO. This could be seen to be associated with the point by Stander & Rothman (2010) about self-efficacy, stressing that if an individual feels that they lack the skills and capabilities to perform a task, they are less likely to engage in it.

Parker et al (2015) emphasise the importance of communication by pointing out that for the development of team level ownership of the vision, the team should have continuous discussions to build on the vision’s sentiments. Pierce & Jussila (2010) also emphasise the importance of team discussions and communication in terms of developing group norms and common ways of working, which have also been shown to facilitate the development of CPO.

2.1.2.2 Asymmetry in psychological ownership in teams with creative lead

It has been recognised by Gray et al (2020) that there is often an asymmetry in psychological ownership in teams that have a strong creative lead and where the project forms around the idea(s) of one person. They stress that this asymmetry might lead to conflict and a weaker sense of CPO within the team. Gray et al (2020) note that when a team forms around an idea that is formed in advance, the three routes (controlling the target, coming to intimately know the target, investing oneself in the target) identified by Pierce and Jussila (2010) are largely absent. This is a valuable point of view for the research at hand, because the case teams are in fact bringing to life someone else's vision, as they are developing a solution for the client company.

As mentioned in the earlier sections, development of CPO requires collective identification, a sense of "us" (Pierce & Jussila, 2010). However, as Gray et al (2020) point out, this identification requires opportunities to influence the creative idea itself, not just the execution of it. They point out that the attempts of the team to shape the idea or concept might lead to conflict within the team. This, of course, weakens the chances for the development of strong CPO. Fortunately, as argued by Gray et al (2020), the creative lead (in this case the PO) can facilitate the emergence of collective psychological ownership with their actions and work as an unifying force, even if there is an initial asymmetry in psychological ownership.

Gray et al (2020) suggest that there are two important actions the creative lead can take to help the team feel CPO for the target: help seeking and territory marking. By help seeking they mean actions which help and invite the team members to give their ideas and input for the target, allowing them to make substantial contributions toward the shared goal. In other words, actively asking for ideas and suggestions from the team, instead of just expecting them to execute ready made plans will help the team form a stronger sense of CPO according to Gray et al (2020). They also note that when the creative lead encourages this kind of participative behaviours, the team members are more likely to react to directive behaviours in a collaborative manner.

Territorial marking on the other hand, as Gray et al (2020) explain, becomes important in marking the boundaries to those who are not part of the team, facilitating team identification. In fact, they note that territory marking by the creative lead can even make the target of ownership more attractive and worthy of psychological attachment, because the creative lead shows strong commitment and passion towards it. On the other hand, if the creative lead does not signal strong ownership towards the target, the team is less likely to identify with the target and thus less likely to develop CPO (Gray et al, 2020).

Gray et al (2010) point out however, that territory marking by the creative lead on an individual level can hold back the development of CPO. They explain that this happens because the team members learn to see the target as property of the creative lead alone and become reluctant to crossing the lines of that territory. To summarise, the creative lead should engage in territory marking behaviours on a collective (marking team territory), but not on an individual level (marking the creative lead's individual territory). Gray et al (2020) note that both of the suggested actions, help seeking and territory marking, are important in laying a fertile ground for CPO within a newly formed team. They stress that the creative lead plays a key role in influencing the unifying and dividing forces that affect the team.

2.1.2.3 Psychological and behavioral effects of CPO

Just as is the case with individual psychological ownership, CPO also has several noteworthy psychological and behavioural effects (Pierce et al, 2018; Pierce & Jussila, 2010; Verkuyten & Martinovic, 2017). Positive effects of CPO on an individual level include increased performance, organisational commitment, low intention to quit, job satisfaction, experienced responsibility, risk taking and sacrifice for the target of CPO, caring and protective behaviors, personal initiative, and organisational citizenship behavior (Pierce et al, 2018; Pierce & Jussila, 2010). It has also been noted that CPO has a positive relation to work engagement and negative relation to burnout (Su & Ng, 2019).

Confirmed collective level effects of CPO are team potency, psychological safety, group learning, taking initiative, team performance, effectiveness, and reduced social loafing (Pierce et al, 2018; Pierce & Jussila, 2010; Verkuyten & Martinovic, 2017). Positive

psychological effects include collective self-esteem, belonging and experiences of meaningfulness (Verkuyten & Martinovic, 2017) as well as pleasure when interacting with a target the group feels ownership for (Pierce & Jussila, 2010). Gray et al (2020) especially emphasise the importance of CPO for success and performance of creative teams. In fact, they point out that according to previous research, novel and innovative solutions are more likely to emerge and hardships and uncertainty are better endured if the team members have a strong psychological bond with their work. Lastly, Khong, Liem, & Klassen (2017) suggest that collective efficacy, one dimension of CPO, is more strongly connected to group performance than self-efficacy on an individual level.

On the negative side, strong CPO can lead to information hoarding, stress, territorial behaviors, resistance to imposed change and obsession with control (Pierce & Jussila, 2010). Verkuyten & Martinovic (2017) also point out that strong CPO within a team can cause intergroup tensions, such as social exclusion or territorial behavior between teams. They explain that this might happen because when it comes to possessions, the fear of losing control is always present. Pierce & Jussila (2010) note that reluctance to share information is likely to emerge if team members lack shared purpose, shared values and common goals with the wider organisation and suggest that strong organisational commitment and gainsharing programs can reduce the possible negative effects of CPO. In figure 2 below the development of CPO is presented as a summary of the previous sections.

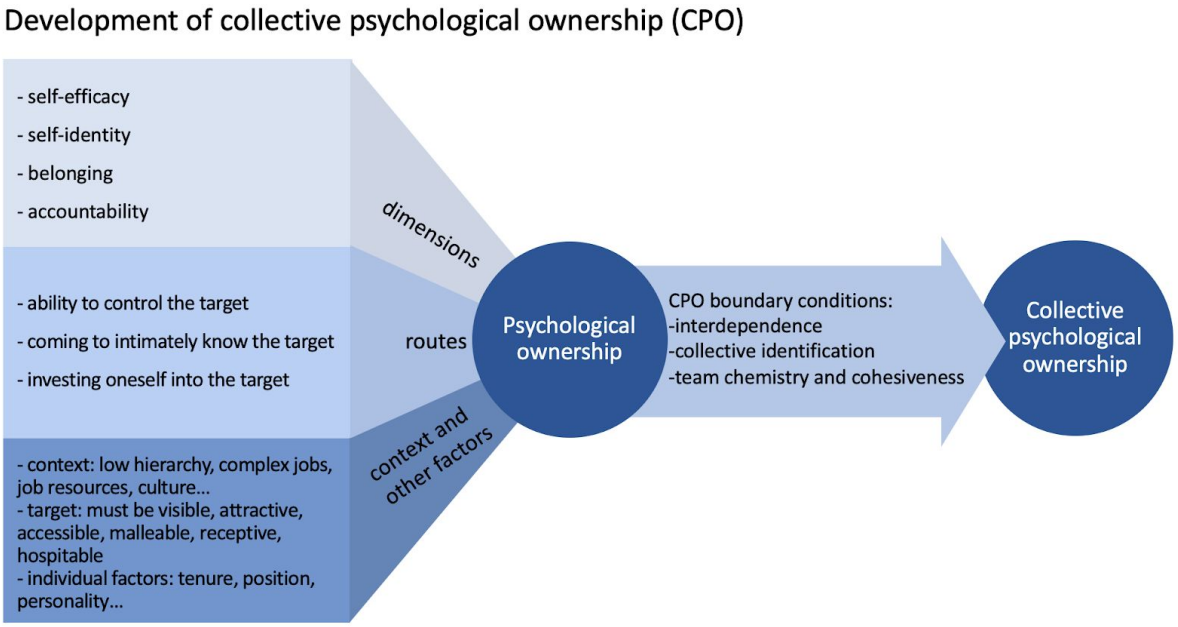

Figure 2, conceptual framework based on the previous research on IPO and CPO.

2.2 Self-organising teams

The use of agile ways of organising, including self-organising teams, has been in the rise in the past decades and many organisations are making big changes in their organisational structures (Aghina et al, 2018; Grundström & Söderman, 2020; Malmberg, 2018; Stander & Rothmann, 2010; Vuorinen, 2019). In fact, research on self-organising has already been done in the 70's (Guzzo & Dickson, 1996; Hoda & Murugesan, 2016; Parker et al, 2015). However, the rate at which different organisations all round the world are adopting this way of organising seems to be increasing (Aghina et al, 2018; Malmberg, 2018; Puumala, 2017; Savaspuro, 2019). Simultaneously, the so-called dark side of self-organising has received plenty of media attention (Ahleskog, 2018; Savaspuro, 2019) and burnout rates are on the rise (Sutela, Pärnänen, & Keyriläinen, 2019).

Pierce et al (2018) note that many organisations have moved to work on a collective rather than individualistic setting, increasing the need for understanding how teamwork could function optimally. In favour or self-organising teams, autonomy has been said to increase team performance in situations where task interdependence is high (Stray et al 2018). Parker et al (2015, p. 112) have defined self-organising teams in the following manner: "A

self-organised team is recognised as a self-regulated, semi-autonomous small group of employees whose members determine, plan and manage their day-to-day activities and duties under reduced or no supervision."

While self-organising teams are not an optimal solution for simple and repetitive jobs, (Parker et al, 2015), they seem to perform exceptionally well in dynamic environments requiring innovativeness and complex problem solving, such as software development (Guzzo & Dickson, 1996; Laloux, 2016; Parker et al, 2015; Richter et al, 2011). In fact, it has been stressed that self-organising autonomous teams are at the very core of agile software development (Beck et al, 2001; Stray et al, 2018). Hoda & Murugesan (2016) support this by pointing out that agile methods rely on collaboration and people oriented approach, while So & Scholl (2010) add that the purpose of agile methods is to be effective in integrating changing customer requirements and improve team collaboration. These practises are closely related to group learning, as it often happens that all team members eventually develop the ability to perform each other's tasks (Pierce & Jussila, 2010). To clarify the intention of self-organising teams, Laloux (2016) points out that the goal is not necessarily to make everyone equally powerful, but to enable all team members to grow to use their full potential.

While self-organising teams are effective and produce high quality results in turbulent and complex environments (Guzzo & Dickson, 1996; Hoda & Murugesan, 2016; Parker et al, 2015; Richter et al, 2011), there are several other benefits as well. According to (Guzzo & Dickson, 1996), participating in self-organising teams results in more favorable attitudes towards work, which is surely in the interest of many organisations. Stray et al (2018) back this up by noting that as self-organising teams stimulate participation and involvement, employees come to develop an emotional attachment to the organisation, are more committed, motivated, and willing to carry more responsibility. It has also been argued that using the team's collective wisdom rather than relying only on the manager's ideas often leads to better ways of organising (Cohn, 2018). Although the use of self-organising teams has several positive effects, it should be remembered that results are always dependent on factors like group composition, goal setting and leadership (Guzzo & Dickson, 1996).

Regardless of their widespread success in dynamic environments, self-organising teams have their own challenges and require plenty of support to perform optimally (Parker et al, 2015; Richter et al, 2011; Stray et al, 2018). For example, Conboy & Morgan (2011) point out that compared to traditional teams, in a self-organising environment many of the tasks related to project management become a shared responsibility of the team. Hoda & Murugesan (2016) argue that this change is meant to increase the accuracy and speed of problem solving, but Conboy & Morgan (2011) warn that sharing the project management responsibilities between different shareholders might lead to challenges. Hoda & Murugesan (2016) suggest that because of this, all the team members should frequently attend project management training.

It has also been suggested that different cultural norms might present a challenge if team members are used to behaving in a certain way (Parker et al, 2015; Stray et al, 2018). So called "external noise" can also disturb the team's work, for example if members have too many responsibilities outside of the current project (Moe et al, 2008). The challenges of self-organising can be seen in the media discussion (Savaspuro, 2019; Valtavaara 2020a, 2020b; Vuorinen, 2019), suggesting that unsuccessful implementation of self-organising might be part of the reason for increasing absenteeism due to mental health reasons and rising numbers in burnout cases.

Although Cohn (2018) and Stray et al (2018) note there is no one size fits all approach to self-organising, the previous research has recognised several prerequisites for it. Autonomy is among the most pronounced of these (Moe et al, 2008; Stray et al, 2018; Takeuchi & Nonaka, 1986). Takeuchi & Nonaka (1986) explain that the team needs to have enough autonomy and freedom to decide about different aspects of their work, or it is simply not possible to self-organise. According to Moe et al (2008) and Stray et al (2018), autonomy can be reduced for example by micromanaging due to lack of trust. Parker et al (2015) note that the managers' willingness to remain incontrol often limits the teams' autonomy. This can present a challenge especially when using agile methods like Scrum, where visibility from outside on what the team is working on can be very low (Conboy & Morgan, 2011). Too many dependencies to others can also limit the team's autonomy and reduce the team's chances to freely make decisions about their work (Stray et al, 2018). Hoda & Murugesan (2016) emphasise that although many external factors can limit the autonomy,

the team should be active in assuming responsibility and not wait for managers to assign tasks or direction.

Clear goals and shared vision are also emphasised as important requirements for self-organising teams (Aghina et al, 2018; Hoda & Murugesan, 2016; Moe et al, 2008; Savaspuro, 2019; Stray et al, 2018). While in software development the goals are often expected to be communicated by the client, they rarely have sufficient technical understanding to define the goals clearly enough (Puumala, 2017). Hoda & Murugesan (2016) add that in software development, understanding customer requirements is critical for a good result and even though the requirements might be delayed, changing or unclear, it is the team's job to seek ways to clarify them. Additionally, Gemunden, Salomo, & Krieger (2005) call for clarification of the goals throughout the process. Hoda & Murugesan (2016) further note that unclear goals make workload estimation challenging and recommend including all team members in the estimation process to build a shared understanding of what needs to be done and how much effort is needed to complete the project. They also note that coming to common understanding about the goals with the client is essentially a negotiation process.

Closely connected to goal setting is the role of honest, open and effective communication, which has also been emphasised as an important prerequisite for self-organising teams (Dames, 2017; Parker et al, 2015), and lack of it as a significant barrier for self-organising (Conboy & Morgan, 2011; Hoda & Murugesan, 2016; Moe et al, 2008). Furthermore, So & Scholl (2010) emphasise the role of communication in knowledge growth and coordination capability specifically in the context of software development. Moe et al (2008) emphasise the importance of communication by explaining that for example insufficient feedback and communication between the PO and other team members is likely to hold the team back from performing to the best of their ability. They further note that insufficient communication and lack of trust between the team members can lead to decentralised decision making and reduced flexibility, failing to achieve the very purpose of self-organising teams.

Conboy & Morgan (2011) underline the role of communication in trust creation, especially in inter-organisational teams. The importance of trust between team members for

self-organising is emphasised by Parker et al (2015) and Laloux (2016) and pronounced in the statement by Stray et al (2018) noting that lack of trust might actually keep the team members back from committing to the common goals. Gemunden et al (2005) emphasise that face-to-face communication is the best way to facilitate effortless information sharing and trust. However, as Stray et al (2018) note, conflict can be expected in newly formed self-organising teams. To facilitate conflict solving and collaboration, formal structures, decision making mechanisms and standardised ways of working are recommended (Aghina et al, 2018; Laloux, 2016; Parker et al, 2015; Stray et al, 2018). Closely related to trust, Laloux (2016) and Savaspuro (2019) highlight the role of psychological safety in self-organising and Parker et al (2015) emphasise the importance of shared beliefs and values as well as excellent team spirit.

Finally, cross functionality has been identified as one of the requirements for self-organising teams (Hoda & Murugesan, 2016; Moe et al, 2008; Takeuchi & Nonaka, 1986). Hoda & Murugesan (2016) emphasise that while interdependence is one of the defining factors for self-organising teams, achieving it often presents a challenge. Moe et al (2008) explain that if each of the team members just focuses on their own area of expertise, the work gets easily siloed and no knowledge sharing is achieved. According to Takeuchi & Nonaka (1986), cross functionality is achieved when the team consists of different individuals with different skills and the members interact with each other to understand each other's perspectives. Parker et al (2015) also emphasise the need for different skills and personalities within the team by stating that while the team should be cohesive, it should allow individuality. Hoda & Murugesan (2016) stress that to achieve cross functionality, team members are required to actively self-assign tasks that support learning new skills, instead of simply staying in the comfort of one's own area of expertise. They add that knowledge sharing and reflective practices are a good way to achieve this with the added bonus of building trust within the team.

In addition to the above, ongoing development and learning (Morgan, 1986, as cited in Hoda & Murugesan, 2016; Parker et al, 2015), shared sense of responsibility (Parker et al, 2015), mutual respect (Dames, 2017) as well as regular self-evaluation and improving

working processes as a team (Takeuchi & Nonaka, 1986) are emphasised as important aspects in self-organising teams.

Several authors emphasise that even in a self-organising environment, leadership and supporting structures are needed (Grundström & Söderman, 2020; Laloux, 2016; Pisano, 2019; Stray et al, 2018). In fact the lack of coaching and organisational support has been identified as one possible pitfall in managing self-organising teams by Stray et al (2018). Furthermore, Guzzo & Dickson (1996) emphasise that leadership significantly affects team performance and Parker et al (2015) note that skilled professionals do not perform well under micromanagement. Laloux (2016) notes that in a self-organising environment, top management is truly a support function, listening and responding to the teams' needs and leading through example. He adds that while it is the management's responsibility to provide support, the responsibility to use this opportunity lies on the team.

Leaders of well functioning self-organising teams have often been referred to as "coaches" (Dames, 2017; Parker et al, 2015; Puumala, 2017; Richter et al, 2011; Stray et al, 2018), claiming that best results are achieved through facilitation and by letting go of micromanagement. This means that instead of traditional "management," leaders should work as facilitators and move obstacles out of the teams' way (Hoda & Murugesan, 2016; Parker et al, 2015). In fact, Parker et al (2015) argue that in the case of self-organising teams, management should base on servant leadership. However, Dames (2017) argues that many people who hold a managerial position aren't there because they have an innate need to serve, but rather because of the control or recognition that comes with the role. She continues that in self-organising environments leaders must accept that there might be mistakes on the way.

Parker et al (2015) emphasise the role of strong and visionary leadership for achieving a clear and common vision. Surdek (2016) on the other hand points out that becoming a team and finding common ways to work might take a while and that leaders have an important role in facilitating decision making in the beginning if needed. He also stresses that leaders should set boundaries for the team, like a "sandbox" in which they can self-organise. Leaders have a big role in team dynamics as well, and as Parker et al (2015) point out, a good relationship between the team members starts with the leader's relationship with the

individuals. Cohn (2018) also underlines the leaders' role in team dynamics and notes that observing the team dynamics and changing or coaching members if needed is one of the main tasks of an agile leader.

Connected tho cross functionality, ensuring multi-skilling and training is also seen as one of the tasks of an agile leader (Parker et al, 2015), accompanied with removing impediments and motivating the team (Hoda & Murugesan, 2016). Building trust practises and fostering psychological safety are also important tasks for the leader (Roy, 2016), as well as facilitating reflection which, when practiced on a collective level, helps strengthen the sense of belongingness (Laloux, 2016).

2.3 Inter-organisational teams

In today's professional world, it is commonplace that project teams are formed over organisational boundaries (Puumala, 2017; Rein & Gustafsson, 2007). This is especially true in agile organisations, where it is customary to have the customer as part of the project team (Conboy & Morgan, 2011; Puumala, 2017). This practise has been suggested to contribute to the development of more innovative and valuable information systems (Conboy & Morgan, 2011). While the use of inter-organisational teams has led to blurring of organisational boundaries, having team members from several (sometimes competing) organisations often leads to mistrust, resulting in lack of transparency and information sharing (Conboy & Morgan, 2011). As seen earlier in the literature review on self-organising teams, reduced information sharing is a severe threat for the functioning of an effective self-organising team (Moe et al, 2008; Stray et al, 2018).

As Johnsson (2018) points out, many of the collaboration initiatives fail due to suspicion on both sides and lack of information sharing. Johnsson (2018) also notes that small teams of four to six people seem to perform better than bigger ones, in which information sharing becomes more complex. Connected to the need of openly sharing information, Rein & Gustafsson (2007) emphasise the importance of trust in cultivating inter-organisational teams. Conboy & Morgan (2011) also stress that shared understanding on conflict solving

methods and on how governance of the project is shared between different parties is crucial for good collaboration.

It has been suggested that clear division of labour combined with transparency, as well as creating a sense of community through relaxed, informal events can facilitate the work in inter-organisational teams (Rein & Gustafsson, 2007). Johnsson (2018) reminds on the importance of clear, commonly shared goals and each member's understanding of their personal contribution to the collaboration. He also notes that each party should gain something from the collaboration and that the project should be assigned enough resources to succeed. Generally, getting to know each other and finding common understanding takes time and effort (Johnsson, 2018).

While work in inter-organisational teams presents challenges, it has been proven to lead to more innovative outcomes as well as increased level of learning across organisational boundaries (Conboy & Morgan, 2011; Johnsson, 2018; Rein & Gustafsson, 2007). Puumala (2017) points out that in knowledge intensive organisations, such as the case company, the customer is an integral part of the value creation and should thus be seen as part of the team. However, having the customer as part of the team can also be limiting, and the level of autonomy required for self-organising cannot be reached completely (Conboy & Morgan, 2011; Puumala, 2017). This is supported by Gemunden et al (2005) stating that project organisations rarely have full autonomy over the goals.

2.4 Connecting the dots from the literature review

Based on the literature review it seems that self-organising teams offer a good starting point for the development of CPO. This observation is supported by the notions of Pierce & Jussila (2010), that the context of teamwork offers good opportunities for CPO to emerge, including the fulfillment of the recognised boundary conditions. Stray et al (2018) further underline that self-organising teams facilitate the development of emotional attachment towards an organisation through stimulating participation and involvement. On the other hand, facilitating the development of CPO in an inter-organisational context presents a challenge, largely connected to lack of trust, problems in communication and

willingness to remain in control. The connections of self-organising and inter-organisational teams to the development of CPO are discussed below.

Firstly, collective efficacy (one dimension of CPO), can be fulfilled in self-organising teams as learning and development of the team members has been seen as an integral part of self-organising teams (Moe et al, 2008; Parker et al, 2015; Pierce & Jussila, 2010). The use of agile methods such as Scrum could also facilitate the process of learning to understand each other's skills and capabilities, contributing to (collective) efficacy. As the sense of efficacy seems to be closely related to learning and acquiring new skills, learning about the client company's business might contribute to collective-efficacy as well. On the other hand, if the client is reluctant to share information and only wants the team to execute the tasks without reflection and learning, collective efficacy might not develop equally.

Parker et al (2015) mention shared beliefs and values as a requirement for well functioning self-organising teams. This could be seen to be connected to the dimension of self-identity in development of CPO. As discussed before, if the target is not seen as something one wants to identify with, CPO is unlikely to emerge. Based on this, it could be argued that if the client company ordering the project has values that are not in line with the team members' values, the development of CPO is unlikely.

Sense of belongingness also plays a big part in psychological ownership and seems to be closely connected to work in self-organising teams as well. Fulfilling the need for connection to other people and having a "home" has been argued to be satisfied in a teamwork context (Pierce et al, 2001; Richter et al, 2011). In the context of inter-organisational teams, Rein & Gustafsson (2007) emphasise the importance of belongingness in the form of creating a sense of community over organisational boundaries. The fourth dimension of CPO, accountability, also has clear connection to work in self-organising teams, as shared responsibility and mutual accountability have been identified as important requirements for well functioning self-organising teams (Parker et al, 2015).

The ability to control the target, one of the recognised routes for affecting psychological ownership by Pierce et al (2001), is closely connected to the work of self-organising teams. In fact, it could be concluded that while the use of self-organising teams increases complexity of the work (Conboy & Morgan, 2011), it offers a lot more autonomy and facilitates team control taking, facilitating the development of CPO (Pierce & Jussila, 2010). Lack of trust, an example of the barriers for self-organised teams underlined by Moe et al (2008), easily decreases the amount of control the team has over the target which reduces the chances for the development of CPO. Too many dependencies to others, a barrier to self-organisation identified by Stray et al (2018), might also decrease the team's chances to develop CPO by reducing their sense of control. Team's chances to control the target can also be reduced due to the inter-organisational context, as the customer is often part of the team and might be experienced as a restriction (Conboy & Morgan, 2011). To avoid the negative effects of this it seems to be essential to see the client representative as truly part of the team. If CPO develops in a team that has accepted the client as part of the team, no "fighting over control" should occur.

The requirement of information sharing and open and effective communication holds true both for self-organising (Dames, 2017; Parker et al, 2015) and inter-organisational teams (Conboy & Morgan, 2011). This could be said to offer supportive conditions for the development of CPO as the team has a chance to travel down the route of coming to intimately know the target. Although open communication is mentioned to be one of the requirements for successful collaboration in inter-organisational settings, Conboy & Morgan (2011) point out that due to lack of trust it often gets compromised, decreasing the chances for development of CPO.

Trust plays a big role in the third route affecting CPO, investing oneself into the target, as Verkuyten & Martinovic (2017) emphasise that when an individual is trusted with the care for an object, investment in it becomes possible. This is clearly connected to the autonomy aspect of self-organised teams, as well as the role of an agile leader as a coach and facilitator rather than a controller (Parker et al, 2015; Puumala, 2017; Richter et al, 2011). Self-organising teams can thus be said to enable the team members to invest themselves in the target, leading to strengthened CPO. In terms of inter-organisational teams, especially in creative software development teams including a client representative in a PO role, the

ability to invest oneself in the target seems to be largely dependent on the actions of the PO. As presented in the section about asymmetry in creative teams, the PO can either facilitate or prevent the team's chances for developing CPO.

First one of the boundary conditions for the development of CPO, interdependence, has clear connection to self-organising teams as it is one of the critical requirements for them as well (Moe et al, 2008; Stray et al, 2018). Interdependence can also be seen to play a role in inter-organisational teams, especially when using agile methods where the client is seen as an integral part of the project team (Conboy & Morgan, 2011; Puumala, 2017).

The second boundary condition for CPO, collective identification, might present a challenge in inter-organisational teams, especially if the team members do not work from the same physical location. In the case of inter-organisational teams, a question could also be raised whether each team member truly accepts the client representative as part of the team. In terms of self-organising teams, different rituals in the agile methods could facilitate collective identification, as through them the team members regularly come in contact with each other and learn about each other's skills and viewpoints. Interdependence and avoiding silos, both critical for self-organising teams, might also facilitate collective identification through collaboration with other team members.

Team chemistry and cohesiveness on the other hand, the last boundary condition for development of CPO, is clearly connected to the requirements for well functioning self-organising teams by Parker et al (2015), including trust amongst members, cohesive team but allowing individuality, shared beliefs and values as well as building team spirit. Open and honest communication could be seen as a way to build team chemistry and cohesiveness needed for CPO and is also called for in self-organising teams (Conboy & Morgan, 2011; Dames, 2017; Moe et al, 2008). The role of trust and psychological safety between team members also plays a big role in self-organising teams, surely contributing to team chemistry and cohesiveness as well. Based on the section about inter-organisational teams, trust seems to be difficult to achieve in that context. Thus it could be said that team chemistry and cohesiveness is more difficult to achieve in an

inter-organisational setting. The figure 3 below illustrates the effects of self-organising and inter-organisational context to the development of CPO.

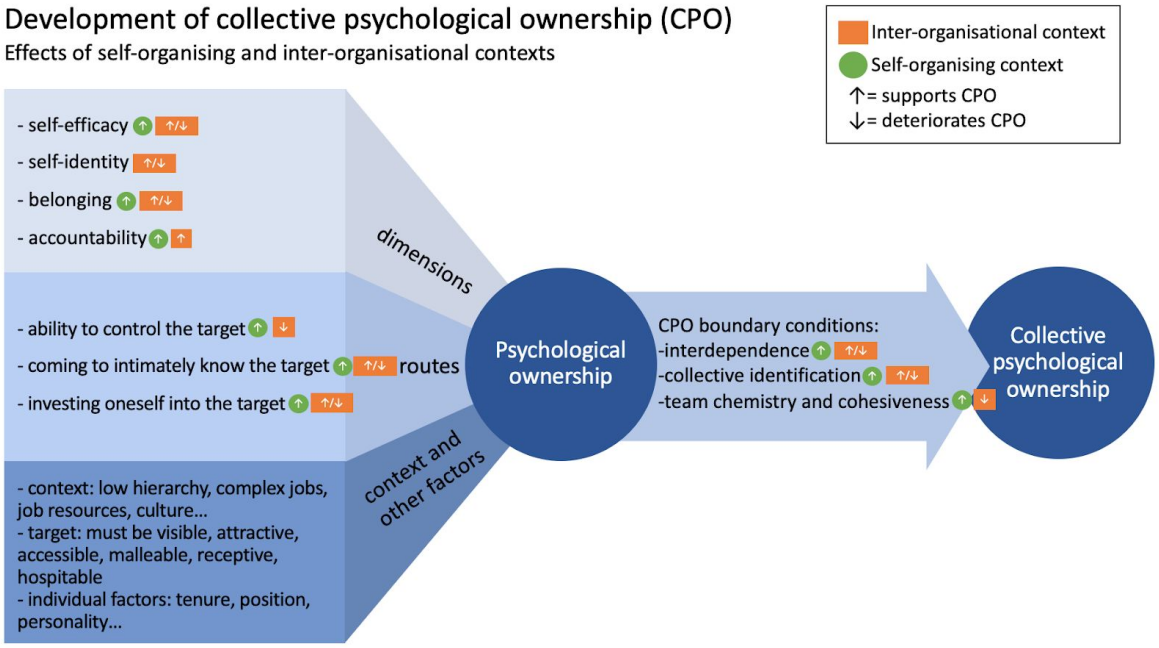

Figure 3, conceptual framework based on the previous research on IPO and CPO combined with the plausible effects of self-organising and inter-organisational context.

In conclusion it could be said that self-organising teams, when implemented well, offer a fertile ground for the development of CPO. This is supported by Pierce & Jussila (2010) and Cohn (2018) stating that CPO is more likely to emerge in self-organising environments. It has even been argued by Pierce et al (2018) that CPO is one of the major paths through which teamwork produces its superior results. Inter-organisational teams on the other hand present bigger challenges for the development of CPO. In an optimally functioning inter-organisational team the requirements for CPO are in place, but this optimal state seems to be hard to achieve due to issues like lack of trust and unwillingness to share information and the control of the target.

3 Methodology

This chapter presents the logic behind the selection of the research approach and explains the characteristics of a case study. Data collection methods are then elaborated in detail, including the rationale behind the sample selection. Further on, the selected analysis methods for each data type are explained. Finally, the validity and credibility of the research are discussed.

The study at hand is a single embedded case study, employing mainly qualitative data collection methods. The study relies strongly on qualitative data because the topic at hand, CPO, is a socially constructed state (Pierce & Jussila, 2010) and thus cannot be objectively measured. Furthermore, qualitative research allows focusing on complex phenomena in their specific context (Eriksson & Kovalainen, 2011), which is the aim of this research.

Eriksson & Kovalainen (2011) also note that qualitative methods are a good choice when the goal is to understand *how* things work and *why* they work in a specific way. Thus the choice of relying mainly on qualitative methods is in line with the research questions, focusing on how CPO develops and how it could be facilitated. More specifically, qualitative methods are used in this study to gain understanding on the development and facilitation of CPO. Both employee and management level are included in the qualitative data collection and analysis.

Although the study focuses on the individuals' experiences and could thus be classified as part of the constructivist research, it is emphasised that strong connections to pre-existing theory has an essential role in qualitative research (Tuomi & Sarajärvi, 2009). In this research the works of other scholars in the area of CPO play a significant role and the collected data is reflected back to the pre-existing theory. As a result of this combination, the ontological positioning of the study is critical realism.

As Easton (2010) explains, critical realists believe that a "real" objective world exists, yet interpretations of it are always subjective. It could thus be argued that critical realism acknowledges the world to be partially socially constructed. Easton (2010) supports this notion by pointing out that interpretation always plays a role in social sciences as meanings

cannot be measured, but they must be understood. Critical realism has been argued to be well suited for case research in which the aim is to understand how things work or why they work in the way they work (Easton, 2010). Based on this notion, it can be said that the philosophical positioning of the study is also in line with the research questions.

Rather than creating generalisable findings or new theory, the aim of this study is to complement previous research about CPO in the context of self-organising, inter-organisational teams. In other words, epistemologically the study relies on abductionism: building on pre-existing understanding about CPO and aiming to develop that understanding through emerging empirical evidence in the context of self-organising, inter-organisational teams.

Abduction relies on an analytical framework as a cornerstone or a guideline, simultaneously aiming to develop it further in confrontation with the empirical observations (Dubois & Gadde, 2002). The importance of pre-existing theory as support during the research process is also emphasised by Van Maanen, Sørensen, & Mitchell (2007), suggesting that data is most useful when used as a way to move between theory and empirical world. The use of pre-existing theory as guidance during the research process has in fact been said to strengthen the explanatory power of a case study (Dubois & Gadde, 2002). The framework for this study is presented on page 32, combining the most significant factors of previous research around the theme of CPO.

3.1 Case study approach

It has been emphasised by Eriksson & Kovalainen (2011) that after developing the research questions, it is those questions that direct the way in which the research is conducted. The research questions of this study are directed at how CPO develops and how it could be facilitated. These are complex questions and the complexity deepens with the understanding that CPO is a collective phenomenon that emerges through interactive group dynamics (Pierce & Jussila, 2010).

To answer complex questions like these, a case study approach was seen to be suitable. In fact, Easton (2002) highlights that case studies are well suited to understanding phenomena that are clearly bounded but complex, such as organisations or inter-organisational relationships. Eriksson & Kovalainen (2011) further note that a case research strategy is a good choice for studies aiming to understand complex business issues that are closely tied to context. As Pierce & Jussila (2010) emphasise, CPO is indeed strongly linked to context, so the use of case study as a research strategy is justified. Another reason for the selection of a case study approach was its practical approach as emphasised by Eriksson & Kovalainen (2011), supporting the goal of offering practical advice for the case company on how to facilitate the development of CPO from a managerial perspective.

Case studies are typically divided into intensive and extensive case studies. Intensive case studies focus on gaining a deep and holistic understanding of a single (or few) cases and creating a thick description that is closely tied to the context (Eriksson & Kovalainen 2011). According to Dubois & Gadde (2002), increasing the number of cases in a study carries a risk of compromising the depth of the research if resources for the research are fixed. To ensure sufficient depth while still allowing different experiences to emerge, a single embedded case study approach was chosen. As Dubois & Gadde (2002) emphasise, learning from a single case should be considered a strength rather than a weakness, since intensive case study allows deeper understanding of the phenomenon in its context. Easton (2002) further notes that intensive case research approach is in line with critical realist ontology.

Because case studies investigate real life phenomena in their everyday context, it should be kept in mind that the results are always closely tied to the specific company and context (Eriksson & Kovalainen, 2011). Thus it should be emphasised that rather than producing generalisations, the aim of this study is to understand the development of CPO in the specific context of the case company and to provide a thick description of the case, in relation to pre-existing theory around the phenomenon of CPO.

This single embedded case study focuses on three self-organising teams within the case company, referred to as T1, T2 and T3. Two of the teams are inter-organisational in nature. The case at hand is a cross-cut study performed during the year 2020.

3.2 Data collection

As a case study research strategy aims to gain a holistic view of the phenomenon at hand, several data sources are to be used (Easton, 2010; Eriksson & Kovalainen, 2011). In this research, semi-structured interviews on two levels of the case company represent the primary data source, supported by secondary sources including employee training materials from internal communication, team meeting observations and a small scale survey. In other words, the case at hand is a mixed method case study. As pointed out by Eriksson & Kovalainen (2011), it is not necessary to collect data from each of the teams in the exact same way, but data collection can be seen as incremental, each layer adding more understanding.

Although the research questions of this study guide the research toward qualitative methods, it is justified to use both qualitative and quantitative data in case studies to construct the case (Eriksson & Kovalainen, 2011). As the topic of the research is collective psychological ownership, it is important to understand the viewpoints of as many team members as possible. However, due to the limitations of the Master's Thesis format, not all team members of all the three teams could be interviewed. The use of the survey offers a way of learning about the perceptions of a wider range of team members within the limited resources.

Combining different data sources through triangulation allows crosscheking of the data as is expected in case studies (Eriksson & Kovalainen, 2011). This is important in the context of CPO as it is a collective state of mind, and should hence be observed as a whole instead of as several disconnected opinions. In addition to the use of different data collection methods, triangulation is also done by performing interviews on two different levels of the company. This enables the observation of different perceptions of CPO on different levels,

which has the potential of revealing misconceptions of how to best facilitate CPO. Triangulation of data is believed to strengthen case study research, as Yin (1994) argues that the results and conclusions of a case study are likely to be much more accurate when relying on multiple data sources and developing affirmative lines of inquiry. This view is also in line with the critical realism approach of the study, aiming to make sense of the reality while knowing that the available means are subjective.

The data collection was conducted on members of the case company as well as the customer representatives, leaving third party representatives (such as other consultancies working on the same project) outside of the scope of this study. Managerial perspective is included through interviews on the ST representatives as well as analysis on the training materials created by the ST. By including the ST's view, more holistic understanding of the case can be gained. The data from all the sources was collected during March-June 2020.

3.2.1 Semi-structured interviews

Majority of the data for this study was collected through 14 semi-structured interviews on two levels of the case company. Semi-structured interviews are a common data collection method in qualitative research (Eriksson & Kovalainen, 2011; Kallio, Pietila, Johnsson, & Kangasniemi, 2016) and suit well for studies aiming to gain understanding on people's perceptions and opinions about complex and/or emotionally sensitive issues, such as CPO. Furthermore, this method allows the expression of diverse perceptions from different interviewees (Kallio et al, 2016).

As pointed out by Rapley (2001), open ended and semi-structured interviews allow the researcher to develop a rich, deep and textured picture of the phenomenon at hand. As CPO is a construct of individuals' collective feelings and perceptions (Pierce & Jussila, 2010) a semi-structured approach is a justified choice, allowing the interviewee the necessary space for individual verbal expressions (Kallio et al, 2016). However, Rapley (2001) argues that interviews are always social encounters, where both the interviewee and interviewer affect the situation and construct the understanding of the reality together.

Thus, it should be kept in mind that the data collected through interviews is always connected to the context in which it is produced and so is never purely objective (Rapley, 2001).

Interviews were conducted in two rounds:

1. Supporting team (ST) representatives (6 interviews)
2. Members of the self-organising, inter-organisational teams (8 interviews of which 2 client representatives)

As preparation for the interviews, an interview guide was developed as suggested by Kallio et al (2016) and Eriksson & Kovalainen (2011). The interview guide is essentially a list of questions, offering structure and support for the interview situation, but should not be followed too strictly (Eriksson & Kovalainen, 2011; Kallio et al, 2016). Following the suggestion by Kallio et al (2016) and Rapley (2001), questions were divided in main topics and follow up questions. For the purposes of this study, several possible follow up questions were developed in advance to ensure comprehensive answers to the questions (Rapley, 2001) and to enable the development of a thick description of the case. In planning the interview guide it was also taken into account that interview questions should be open ended, not leading, and interviewee oriented (Kallio et al, 2016; Rapley, 2001).

Kallio et al (2016) point out that because the interview questions in semi-structured interviews are based on previous knowledge, some level of previous study in the topic is required. For the purposes of this study, most part of the literature review was completed before the development of the interview guide for the first round of interviews. Themes like ways of working, communication and team composition were included in the questions, drawing insight from Pierce & Jussila (2010), Avey et al (2009) and Verkuyten & Martinovic (2017) among others scholars in the area of CPO and self-organising teams.

As noted by Eriksson & Kovalainen (2011) and Easton (2010), it is common in case studies to have the different phases of the study overlap with each other. In this research, the full literature review as well as initial analysis on the first round interviews were

performed before the development of the interview guide for the second round of interviews. Examples of the questions used in the interviews are presented in appendix A.

All the interviews were performed as online interviews through Google Hangouts or WhatsApp during March-May 2020 and interviewees were selected on voluntary basis, taking into account their role in the case company. Fortunately, many case company employees were willing to participate in the research, so the collected data covers both levels of the company as well as all three of the target teams. Apart from one interview in the first round, video connection was also used to facilitate the social interaction and to be able to read nonverbal expressions. Interviews lasted from 45 to 65 minutes and were all recorded and transcribed as recommended by Tuomi & Sarajärvi (2009).

During the interviews, the recommendation by Rapley (2001) for the interviewer to remain neutral and aim to encourage talk without leading the answers to any specific direction was taken into account. In addition, different probing techniques like repeating the heard information or remaining silent were used, as suggested by Kallio et al (2016) and Rapley (2001). Furthermore, it should be kept in mind that aspects like trust can play a big role while talking about perceptions and feelings, so the ability of the interviewer to create a safe, comfortable space is likely to affect the results of the study substantially. Prior and during the interviews, the trust was created by clearly communicating what the study is about, the confidentiality and anonymity of the conversations as well as aiming to connect with the interviewees through light and non-formal tone of conversation.

The goal of the first round of interviews was to gain broad understanding on how CPO is currently supported in the organisation and how the ST sees their role in the process. The goal of the second round of interviews was to understand how the employees experience the development of CPO and what might work as barriers to it, as well as how they experience the STs' efforts in facilitating the development of CPO. In the second round of interviews, client perspective was also included through interviewees from two client companies.

3.2.2 Secondary data sources

Secondary data sources were used to gain a more comprehensive understanding of the case. Secondary data includes quantitative data from a small scale survey performed on all team members of each of the three teams, internal training materials as well as observation of a team meeting of two teams.

A small scale survey was performed on the case teams' participants. Although the sample of the survey is not big enough to perform comprehensive statistical analysis, the use of a survey is justified to reach a broader number of team members. As CPO is a collective phenomenon, reaching as many team members as possible is crucial for thoroughly understanding the phenomenon. Furthermore, as interviewees were selected based on initial interest towards the topic of CPO, including the rest of the team members through the survey balances the results and ensures that not only the most motivated team members' opinions are heard. Through the survey, customer representatives' opinions were also included in the study, adding valuable information as the interest was to understand development of CPO in an inter-organisational context.

The survey consisted of two parts. Firstly, an individual psychological ownership scale by Avey et al (2009) consisting of 16 questions. The questions covered both the territoriality dimension as well as the four positively oriented dimensions: self-efficacy, accountability, sense of belongingness, and self-identity. The second part of the survey was based on the CPO scale developed by Pierce et al (2018), consisting of four questions about collective psychological ownership towards the ongoing project. The answering scale in the first set of questions was from 1 (strongly disagree) to 6 (strongly agree) and in the second set of questions from 1 (strongly disagree) to 7 (strongly agree). Including the individual level of psychological ownership in the survey is justified, as it has been concluded in the previous research by Pierce & Jussila (2010) that for CPO to exist, individual level ownership is likely to be developed first.

The survey was completed through Google Forms and all of the answers were stored and analysed in Google Sheets. Links to the survey were sent via email to the team members of

the selected case teams and answers were submitted during April and May 2020. No personal data was collected in the survey, but due to collection of background variables (team, position, tenure), it was possible to identify some of the participants. All the data from the survey was anonymised before writing the results. Examples of the survey questions can be found in appendix B.

Employee training materials were used to gain understanding on the internal communication and interaction and have been created by the ST representatives. These materials were provided directly by the case company during March and April 2020. Training material consisted of several PowerPoint presentations with different themes, such as introduction to sales and introduction to ways of working in the case company. These materials were only analysed based on the written and visual content of the slides. In other words, the actual presentation of the materials was not taken into account in this research.

Finally, a team meeting was observed in two teams and field notes were collected. This allows deeper understanding and richer description of the case as participants can be observed interacting with each other in their normal work context, in contrast to the rather artificial interview situation. The aim of the observation was to see if the participants actually interact in the way they claim to interact and if any additional issues affecting the team's communication and dynamics would rise. Due to the Covid-19 pandemic the meetings were organised through Google Meets. However, as online meetings are a common practise in the case company even outside of this exceptional situation, it is unlikely that the format affected the results of the observation.

3.2.3 Sample

Data was collected from the case company's ST representatives as well as the team members from three different teams. The selection of the research participants was planned together with the case company representative, who worked as an owner of this research project, facilitating the communication with the employees. The final selection was made on a voluntary basis.

For the interviews, the primary data source, the sample size was 14, of which six were ST representatives and eight were team members of the case teams. ST representatives included in the study were management team members and senior consultants in management positions. Two case company employees from each of the three teams were interviewed to gain a more multifaceted view on the dynamics within each team. In addition, the POs from two case teams were interviewed as well. The interviewees represented different tenures, backgrounds and genders.

The online survey was distributed to all the members of the three case teams via email to get the broadest representation possible. The aim of the survey was to gain a broader level of understanding on how each team experiences CPO, even though interviews on all teams members were not an option due to limited resources. The final number of responses to the survey was 13, including six answers from T1, five answers from T2 and two answers from T3. The POs' answers from each team were included in the survey, allowing further understanding of the customer side's experiences and of CPO. As the survey was performed anonymously, survey respondents and interview participants are likely to overlap.

The employee training materials used as a secondary data source consisted of eight sets of PowerPoint presentations, each including 9-30 slides. Finally, in terms of team meeting observations the selection was based on availability and suitable schedules within the three case teams. Furthermore, the client company representatives of the observed teams had to agree to the observation and get permissions from their supervisors. Eventually, two team meetings were observed, one from T1 and one from T2. However, as noted by Eriksson & Kovalainen (2011), in a case study it is not necessary to collect data from each source in the exact same way, but each source makes its own contribution to the construction of the case. The data collection sample and case structure is presented in the figure 4 below.

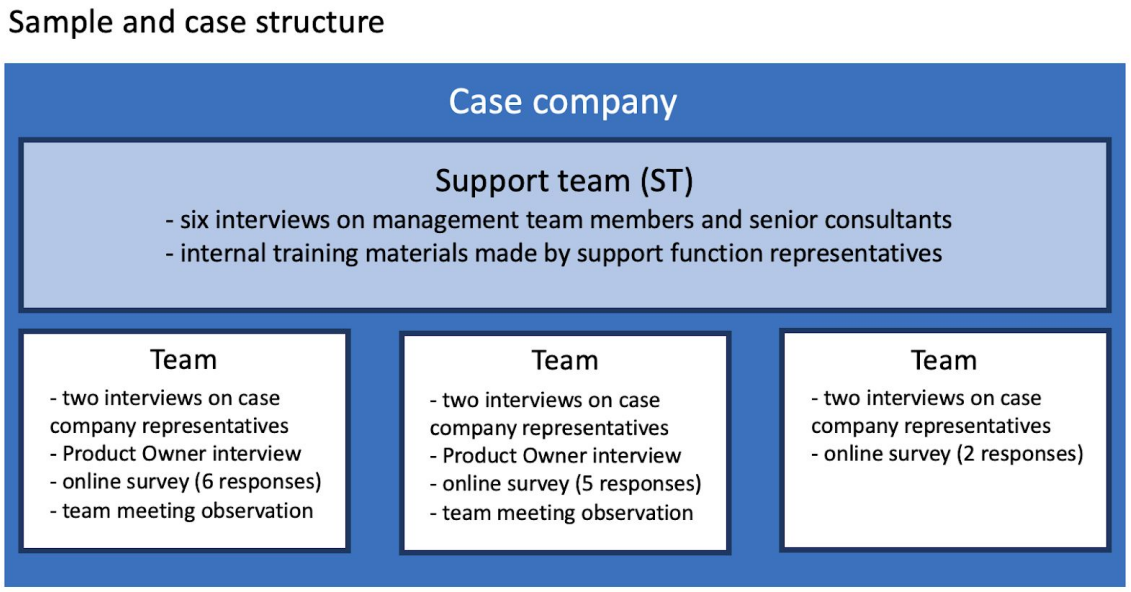

Figure 4, data collection sample and case structure.

3.3 Data analysis methods

In this section the qualitative and quantitative data analysis methods used in this study are presented and the logic behind the selection and usage of each is explained. The steps taken during the analysis process are also specified.

3.3.1 Thematic analysis for qualitative data

Analysis of the qualitative data was performed using the thematic analysis method. According to Braun & Clarke (2006), organising and describing the data through the process of thematic analysis can help in identifying and analysing patterns in the data in rich detail. Furthermore, they point out that this method allows the use of data items from varying sources within the same analysis, in the case of this research interview transcripts, training materials and field notes from team meeting observations. In this research, all of the qualitative data was subjected to the process of thematic analysis.

According to Braun & Clarke (2006), thematic analysis can be used as a "contextualist" method, not positioning in either of the polar opposite of positivism and constructivism,

but taking an ontological positioning of critical realism, which is the case with the study at hand. They emphasise that the coding can be done in different ways: inductive, deductive or abductive, and that the coding process should be in line with the epistemological positioning. Epistemologically this study relies on abductionism, systematically combining pre-existing theory with empirical data. Because of this, the data was coded with the specific research questions in mind, rather than aiming to find all the possible themes from the data.

Since the aim of this research was to add on and improve pre-existing theory about CPO, the framework presented on page 32 was used as support in defining the themes. This enables the interplay of theory and method that is characteristic for abduction (Dubois & Gadde, 2002). Van Maanen et al (2007) also point out that theory and method are in constant interplay, and pre-existing theory can affect the method, for example through the types of constructs it proposes. Eriksson & Kovalainen (2011) support this by explaining that although no set coding system is used from the existing theory, theory can be used as part of the analysis for support. However, Dubois & Gadde (2002) remind that even when using pre-existing theory as a guideline in the analysis phase, forcing the empirical data to fit pre-existing categories is not a good practise, and that instead the themes should be developed in collaboration with the data. Keeping this in mind, flexibility in the analysis was allowed and the emerging themes were reflected back to the data to test for accuracy.

Braun & Clarke (2006) note that another decision to be made in terms of the process of thematic analysis is between semantic and latent levels of analysis, of which the former was selected for this research. Semantic approach focuses on the explicit and surface meaning of the data, without aiming to see beyond it to the underlying meanings (Braun & Clarke, 2006). In other words, the analysis focuses on what is said and written, instead of trying to make assumptions of what makes the participants say the specific things. In the semantic approach of thematic analysis the process flows from description to interpretation and finally to discussing the meanings and implications of the patterns in relation to previous literature. This approach is in line with abduction, the epistemological positioning of the study.

Along the guidelines suggested by Braun & Clarke (2006) for the thematic analysis method, the analysis of the qualitative data in this research consisted of the following steps:

1. Familiarising with the data
2. Coding
3. Arranging codes into themes
4. Forming of the thematic map for each round of analysis

Following the division in the data collection phase, the initial analysis (steps 1-4) of the qualitative data was also performed in two separate rounds: first focusing only on the data reflecting the perceptions of ST representatives around the theme of CPO (interviews and training materials) and then moving on to data concerning the team members' perceptions of CPO (interviews and observations). Keeping the STs' and team members data analysis separate allowed making comparisons between the two groups later on in the analysis process. This was important, since one of the main goals of the research was to identify possible gaps between how the ST representatives think CPO emerges and how it could be facilitated, and how the team members actually experience the facilitation and the emergence of CPO. After forming the thematic maps for both of these groups, the process was finalised with the following steps:

5. Finding connections and differences between the two thematic maps (SF and team members)
6. Combining the two thematic maps to form a final thematic map
7. Forming of a coherent story about the identified themes
8. Reflecting the findings of the thematic map back to theoretical framework in light of the research questions

As Braun & Clarke (2006) note, familiarising with the data already starts in the data collection phase and in case of interviews, continues while writing the transcripts. During these two processes a good overall understanding of the data was formed. As noted before, in the interview situation the reality is constructed together as a social interaction between the interviewer and the interviewee. Keeping this in mind, the interviewer talk was also

included in the transcripts to achieve a more comprehensive analysis, as suggested by Rapley (2001).

Next, the transcripts from round one were combined in one file and the coding process was initiated by reading through all the material and marking the data extracts that were seen relevant in the light of the research questions. Later all of the transcripts were read again, creating codes to represent each group of extracts and adding any extracts that were missed on the first round. Coding was continued by going through the same process with the training materials and combining the data extracts of interviews and training materials under the same set of codes. Examples of the codes used in this phase include "type of the project," "ways of working" and "team composition." Total of 65 codes were created.

During the coding process, recommendations from Braun & Clarke (2006) were followed: creating a wide variety of codes, keeping the context in the extracts, allowing the coding of one extract to several different codes and including possibly conflicting extracts. At the end of the coding process, codes were refined. Some that only contained few extracts were combined with others and some that were very broad were divided into smaller, more descriptive codes. Since most of the data from the ST was in Finnish, codes were also created in Finnish.

After the coding process, codes were arranged into themes. Visualisation was used here, as all the different code names were written to post-it notes and arranged into piles that form meaningful themes. A temporary miscellaneous theme was used, which was later dissolved into new and existing themes through the iterative process of the analysis. Braun & Clarke (2006) emphasise that this step of the analysis process already involves interpretation, as the themes do not just "emerge" on their own, but the researcher has an active role in the process. They also point out a possible pitfall in this part of the process to be the use of research questions as themes. Keeping this in mind, there was special effort in trying to stay true to the data and genuinely forming the themes from the empirical data. In short, as Braun & Clarke (2006) explain, a theme should capture something essential about the data set in relation to the research questions.

Having formed the initial themes, the suggestion of Braun & Clarke (2006) was followed and the themes were reviewed against the whole data set and against the research questions. The coherence of each theme was also inspected. Some adjustments to the themes were made here until four themes were identified. The final themes formed from the first round of analysis were "goal setting," "dynamics on the teams' edges", "dynamics within the project team" and "team members' personal level." The forming of the thematic map was an iterative process alongside refining the themes, aiming to identify their essence and the relationships between them. The iterative process also included reflecting the emerging thematic map back to the data and to the research questions to find a form that accurately represents the data and is meaningful in terms of the research objectives.

The same steps were followed with the data from the second round of data collection: interviews with team members and team meeting observations. This round also included the data from the PO interviews, as they are part of the teams. On the second round of analysis, the data extracts were also kept in their original language during coding. About half of the data in the second round of analysis was in Finnish. Translation to English was done only when writing the results to prevent the translation from affecting the analysis process. The total number of codes used in this round of analysis was 53.

The themes "dynamics on the teams' edges," "dynamics within the project team" and "team members' personal level" were identified in the second round of analysis as well. After having gained more understanding of the team members' perspective, the previously independent theme of "goal setting" identified in the first round of analysis was merged with the theme describing dynamics on the edges of the team. This way, the three final themes from the qualitative analysis were "dynamics on the teams' edges," "dynamics within the project team" and "team members' personal level," in each of which, both STs' and team members' views were included. Examples of the codes used in the analysis under the respective themes can be found in appendix C and examples of the data extracts describing high and low CPO teams in appendix D. After identifying the final themes, the results and analysis was written based on the thematic map that contained the two levels of analysis. Having initially formed the thematic maps separately, enabled comparisons between the ST and team member views on CPO. After writing the results and analysis,

the findings were further analysed in relation to the previously presented framework in the light of the research questions.

3.3.2 Quantitative analysis for the survey data

Because CPO is a collective phenomenon, aiming to understand the CPO of the whole team was seen fit, in addition to the individual interviews. In analysing the quantitative data from the small scale survey, the main interest was in being able to compare the case teams with each other as well as different individuals' sense of ownership based on their background variables. As the POs of each case team also responded to the survey, comparison of the POs' IPO and CPO against the rest of the team members' IPO and CPO was possible.

As the sample size was small (n=13), the aim was not to provide statistically reliable results, but rather to discover possible differences specific for this context between the case teams and between different background variables. As noted by Eriksson & Kovalainen (2011), while the focus of a case study is to provide a thick description and interpretation of meaning, a case study does not need to satisfy the ideals of quantitative research. Results were analysed through comparisons of averages, variance and correlation coefficient. Since the survey included two scales (range 1-6 for IPO and range 1-7 for CPO) the data set ranging from 1 to 7 was normalised to the range of 1-6 to allow for comparisons between the two.

The case teams were compared with each other by using the averages of each team's IPO scores as well as CPO scores. Variance within the teams in their scores of IPO and CPO was also measured. The maximum and minimum scores on both scales were compared to the background information, such as tenure and position. Then, the answers to both IPO scale and CPO scale were analysed in relation to the tenure of the respondents using correlation coefficient. Correlation coefficient was also used to analyse whether or not the team size correlates with the level of CPO in the case teams. The answers regarding team size from the respondents within the same team were also compared to see whether the teams have a shared understanding of the team composition. Finally, the comparison

between POs and the other team members was done by comparing the individual POs' experience of IPO and CPO to the average levels of IPO and CPO in their teams.

Four questions in the survey addressed the territoriality dimension of psychological ownership. However, as this study focuses on the emergence and facilitation of promotion oriented collective psychological ownership, data from those questions was not included in the analysis. After the quantitative analysis the results were reflected back to the qualitative data as well as the initial framework of the study.

3.4 Validity and credibility of the study

The study was done following a research plan, approved by the case company and the thesis supervisor Alexei Koveshnikov. The research scope was defined so that making meaningful contributions to the previous research was possible within the Master's Thesis format and the timeline available. The planning and scoping was done in collaboration with the case company representatives to ensure sufficient understanding of the context and realities of their work. Recommendations by Eriksson & Kovalainen (2011) were followed related to case studies, to use several different data sources and to aim for a rich description of the case.

The literature review was done until the point of saturation, allowing a rich understanding of the existing research about CPO. The context factors were taken into account in the literature as well, by dedicating an own section for previous literature about self-organising teams and inter-organisational collaboration. All of the meaningful points from the literature review were collected in a mind map, ensuring that each perspective gets equal attention.

The full data collection and analysis process has been outlined in the Methodology chapter above, including justification for the decisions throughout the process, making the process transparent and replicable. The data collection was planned to include several different data sources and perspectives to avoid drawing conclusions on too light basis as well as to

allow the richness of differing experiences. In the thematic data analysis, guidelines by Braun & Clarke (2006) were followed closely and possibly conflicting data extracts were included in the analysis. In the quantitative section of the study, previously developed and validated scales by Avey et al (2009) and Pierce et al (2018) were used to measure IPO and CPO of the participants. As the sample size is small (n=13), these results of the survey were not relied on to draw independent conclusions, but rather as a rough guideline and support for the qualitative findings.

No conclusions are drawn based on a single participant's answers, but each of the main findings relies on multiple perspectives. Including more than one representative from each case team and the ST strengthens the validity of the study and weakens the effects of possible biases in the findings. Although the focus of the study is mainly on the case company, including representatives from two of the client companies in data collection provides a valuable alternative perspective, challenging the ideas of the case company representatives and resulting in richer data.

According to Dubois & Gadde (2002), finding a good balance between theory and data can be challenging, and while being too tied to the previous theory might prevent the researcher from seeing the important features in the data, having a too loose framework can lead to data overload. In aim to find a good balance between previous research and empirical data, the framework was constructed first and was then used as a guideline while planning the data collection and analysis, but the data analysis phase was not limited by the framework. Furthermore, open-ended questions were used in the interviews to allow the interviewees to tell about their experiences in their own words, while relying on a carefully prepared interview guide as suggested by Kallio et al (2016).

Finally, the discussion section about the results is closely tied to the framework and existing research, outlining the contributions of this study to the research about CPO and underlining the main points of gained understanding and learning, as called for by Dubois & Gadde (2002). In writing the discussion section, the aim was to lay out the thought processes leading to the connections between the theory and findings as well as the suggestions given. As stressed by Dubois & Gadde (2002) and Van Maanen et al (2007), the researcher must make some difficult choices on what to include in the final paper, as

not to end up with confusing and vague theory describing too much with too little focus. Thus while presenting the results, only the most prominents findings are discussed, aiming to form a coherent picture of the development and facilitation of CPO.

The warning of Easton (2010) was taken into account while writing the results as well, pointing out that while researching complex systems, making causal misattributions on too light a basis should be avoided, as there might be multiple overlapping mechanisms in place affecting the system and causing the same events. Thus, no single mechanism is claimed to lead to certain end results. Finally, the research claims not to be generalisable to all inter-organisational self-organising teams but focuses strictly on the case company's context.

4 Empirical findings about the development and facilitation of CPO

In this chapter the results of the research are presented, laying out the most prominent themes emerged from the data as well as comparing the ST representatives' perceptions about CPO to the team members' experiences of CPO. The three different case teams are compared with each other, based on the team members' interviews and the survey results. The data from the team meeting observations is used to identify good ways of collaboration in practise rather than comparing the teams with each other, since only meetings of T1 and T2 were observed. Team members are referred to as M1 and M2 and ST representatives as S1, S2, S3 and so on. The term "third parties" is used to refer to all organisations other than the client and case company that are involved in the projects.

4.1 Quantitative results - case team members' experience of IPO and CPO

This section discusses the quantitative results of the study based on the survey data. The survey respondents include members for all three case teams. The respondents do not include ST representatives as the interest was in understanding the level of IPO (individual psychological ownership) and CPO the case team members feel towards their ongoing projects.

The survey revealed that T1 and T2 feelt a high level of CPO (5,0/6 and 5,1/6 respectively), while on T3 the level of CPO was significantly lower (3,0/6). Interestingly, the T3 members seemed to feel higher individual ownership for the project than CPO, as their average IPO exceeds their average CPO by 0,38 points. In both of the higher CPO teams the IPO was lower than CPO, by 0,62 points in T1 and by 0,89 points in T2. It must be remembered however, that since the scales used to measure IPO and CPO have been developed by different researchers, the results might not be directly comparable.

The highest IPO among all respondents was found in T1, being 5,17/6, while the lowest (3,25/6) was found in T3. The highest individual experience of CPO on the other hand was found in T2, a full 6/6, while lowest individual experience of CPO was again found on T3, 2/6. The above mentioned minimum and maximum values are from respondents who have

been working with the case company for less than two years and are not in any leading roles within the team. It is noteworthy that the variance of answers regarding CPO is much higher compared to the variance of IPO scores, suggesting that all respondents feel at least a moderate level of IPO, while the experiences regarding CPO vary significantly.

Another interesting point in terms of experienced CPO is that the POs of both teams with high overall CPO (T1 and T2) feel about the same level of CPO as their teams on average. In T3 on the other hand, the PO seems to feel much higher CPO than the other survey responder from the same team. An unexpected result is that in T1, the PO scored lowest on the IPO scale, suggesting that each individual in the team feels higher IPO towards the project than the PO. In the figure 5 below, each team's CPO can be seen by each individual team member who replied to the survey. The POs' answers are marked with darker colours.

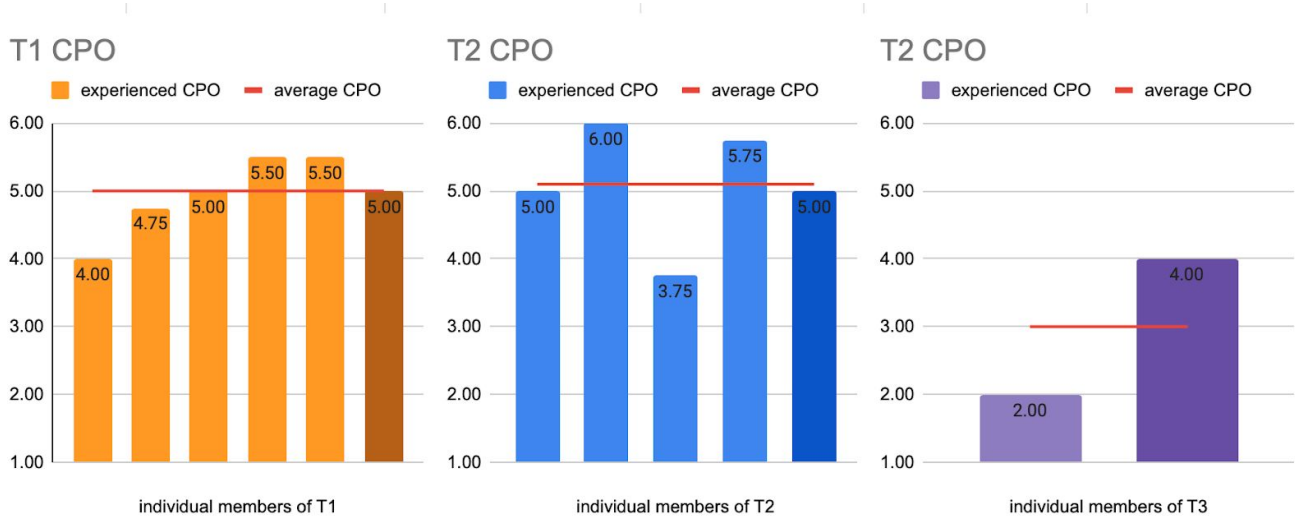

Figure 5, experienced CPO in each of the case teams (average in T1=5.0, in T2=5.1 and in T3=3.0)

The variance between the team members' answers was smallest in T1 (0.26) and highest in T3 (1.0). However, as the number of respondents per team varied greatly, no statistical analysis can be made based on these values.

The tenure of each respondent with their current employer was asked as background information and was then compared to the experienced IPO and CPO. The correlation of tenure and IPO in this sample is slightly negative (-0,21), while the relationship between the tenure and experienced CPO shows no correlation at all (0,06), as the figure 6 below displays.

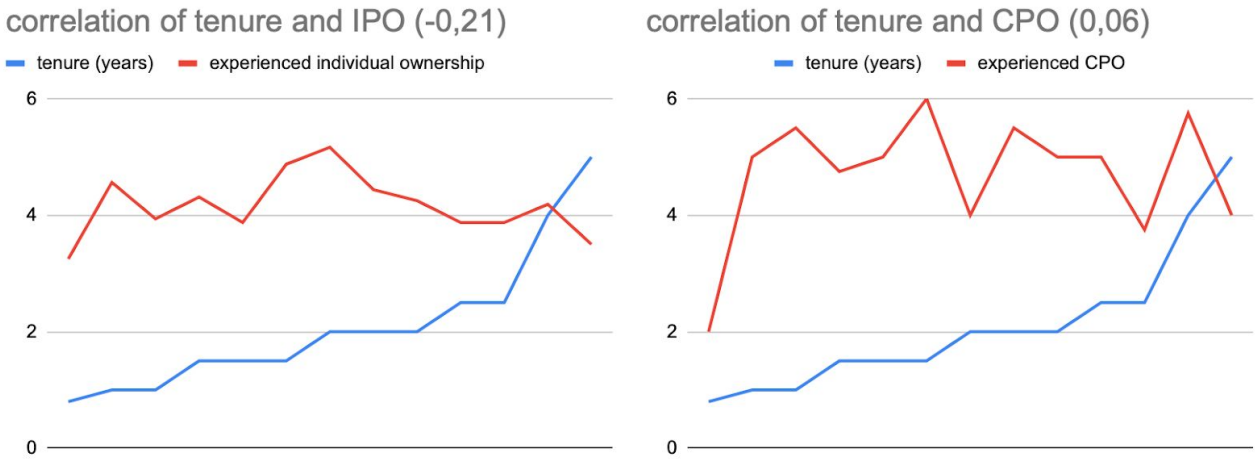

Figure 6, correlation of tenure with IPO and CPO

Finally, the effects of the size of the project team were analysed. The noteworthy finding here is that none of the teams had converging opinions about the team size. T1 answers varied between 5-10 members, T2 answers between 6-7 members and T3 answers between 5-6 members. As the average levels of CPO in the teams are 5.0/6, 5.1/6, and 3.0/6 respectively, no correlation between the team size and CPO was found in this sample.

4.2 Qualitative results - the development of CPO on three levels

This section presents the qualitative findings about the development and facilitation of CPO. Based on the thematic analysis process, three different themes were identified in the data: 1) dynamics on teams' edges, 2) dynamics in the team and 3) team members' personal level. These three levels affecting the development of CPO are layered and often affect the teams' CPO simultaneously. This section discusses each theme in detail, progressing from the edges of the team towards the team members' personal level.

4.2.1 Dynamics on the teams' edges

The surroundings of the team appear to have a significant effect on the opportunities the team has for developing CPO. The opportunities to develop CPO can be limited or enhanced from several directions when the team is in touch with the external world, such as the wider client company, the case company or possible third parties. Defining who is "inside" and who is "outside" of the team is not always straightforward. The most uncertainty regarding the team composition touches the PO, as some teams see the PO as part of the team and others do not. This is why in some cases, the PO is referred to as "client" and is discussed in this section touching the edges of the team. This section first discusses the dynamics between the team and the client company, then proceeds to discuss the dynamics between the team and the case company and finally, touches on the dynamics between the team and the possible third parties.

4.2.1.1 Dynamics between the project team and the client company

In terms of the dynamics between the team and the client company, open communication and trust are clearly the most significant prerequisites for the development of CPO. These two are closely intertwined and together affect the other aspects of the development of CPO, such as participative goal setting and ways of working. The facilitation of communication between the team and the client company is seen to be largely the PO's responsibility, improving the transparency between different stakeholders. The role of the PO as facilitator of the communication was clearly seen in the meeting observations of T1 and T2, where the POs for example communicated the progress of the project to the client company and updated the teams about changes and new requirements.

Although the PO carries much of the responsibility about communication, the interviewees see proactivity from the wider client organisation to be important as well for achieving open two-way dialogue. A good example of this was mentioned by one of the members of T1, explaining that the client company had invited the whole team to participate in some of the company events. Other team members also commented that welcoming the team members to the client company and familiarising them with the operations as if they were

new employees might increase the sense of CPO through feeling more welcome and acquiring more valuable information related to the project.

All interviewees agree that in addition to the PO, the rest of the team should have an active role in communication as well. Thus, having direct communication channels available for the teams to reach different shareholders on the client side was seen as valuable by the team members, not having to rely solely on the PO for information sharing. The interviews indicated that the team has responsibility for communications to two directions: communicating the business results and progress of the project to the client company as well as asking for information they might need to take the project forward, such as clarification of goals. S1 comments on the team's responsibility in communication as follows: "If the client doesn't share the information and the team doesn't have the understanding, they should actively ask and find out the reasons why this project is being done. And if the business goals change, the team should stay up to date. It's much on the team's shoulders to actively look for the information. It cannot be completely ensured by anyone from the outside."

This kind of behaviour of actively seeking for more information about the project was seen in both of the teams with high CPO. The team's responsibility of communicating the business results to the client company was more pronounced in ST interviews, while the teams seemed to focus more on acquiring the needed information and presenting the progress in terms of different features. The ST representatives clearly see it as their role to coach the teams to communicate about the business results to the stakeholders of the client company in a more active manner and in a language that they understand.

There seems to be two mechanisms behind the effects of open communication to CPO: when the client company knows what the team is doing and why, it is easier for them to trust the team and give them the needed autonomy, increasing the CPO within the team. Additionally, the team's visibility to the client's broader business context is commented to strengthen the CPO by helping the team understand how their project fits in the big picture and what kind of business challenges it aims to solve.

In all of the communication between the client company and the team, solid and trusting interpersonal relationships seem to be of great importance. In fact, all of the interviewees agree that a sufficient level of trust enables the client to give the team responsibility and autonomy over the project, which are some of the main building blocks for CPO. Many of the interviewees view that when trust is in place, the team is more likely to act in a self-organised way and develop a stronger CPO. An example of this can be seen in a comment by S3, reflecting back on a team with strong CPO: “Team members were trusted and they had the freedom to make decisions, so there was a strong trust towards the team members' expertise. I think that the level of trust correlates with the level of self-organising and of the collective ownership.“

Many interviewees see the level of trust to be strongly connected to being able to follow agile ways of working, which require the team to have a certain level of autonomy. When the client’s organisational culture is not based on trust and is far from self-organising, conflicts easily arise and collaboration suffers. S5 explained how this might lead to ill-being of the team members: “The client has not lived in this kind of world where you trust the employees, but they wanted to be part of the very micro level, and the big picture not being very clear the environment became very stressful for all parties.” Because the ST views that most of the client organisations are not initially ready to let go of the control, they emphasise that agreeing about the common ways of working before initiating a project is crucial. This is viewed to be both the team’s and ST’s responsibility.

If the stakeholders from the client side are too involved and limit the team’s freedom and ways of working, the sense of responsibility and CPO might not develop. The interviewees comment that this lack of trust affects CPO negatively, as seen in a comment by T2/M2: “It leaves the team with a sour taste, that it doesn’t really matter what we do, that if the client has just bought a few pairs of hands, we’ll just work as few pairs of hands and no more.” The interviewees explained that in some cases the mistrust from the wider client organisation was so strong that the PO could no longer protect the team’s space, but the client’s stakeholders started to limit the teams’ ways of working significantly by micromanaging, demanding heavy planning and reporting or even threatening. This is clearly seen in the S3 comment about a past project where the team had low CPO: “The

PO was from the client side, a strong part of the team who saw the things in the same way as we did. But the client organisation around her was very unstable, weak communication, micromanaging, not trusting the team."

Many interviewees even commented that although the project itself was interesting and the initial CPO was high, frustration towards the client company significantly lowered the CPO over time. Conflicts between the client and the team were said to arise especially about ways of working, goal setting and budgets. According to the interviewees, in many examples with low CPO these conflicts affected the working relationship so fundamentally, that collaborative product development suffered: "We were already late and expenses kept piling up and we were fighting about what is included in the budget and what is not. When the communication channel was reserved for the budget fights, it was impossible to productively discuss the product development as the atmosphere was already damaged," said S4 about a team with low CPO.

In cases where the PO was not perceived as part of the team, the blaming and demanding often took place between the team and the PO, decreasing the quality of collaboration and contributing to lower CPO. S4 described this dynamic vividly: "The customer representative was a difficult personality and we ended up confronting each other, throwing the blame back and forth and sending emails saying 'this is your fault, fix it' and 'no, this is your fault you should fix it' and so on." Interestingly, some of the ST representatives saw demands from the team to the client as a good practise and suspected this kind of behaviour to increase CPO in the team. The ST seems to even encourage the teams to demand certain ways of working from the client.

Based on the ST comments it seems that when conflicts arise, the team members from different organisations are likely to draw further from each other and position themselves psychologically closer to their employers. Thus, in conflict situations it seems to be crucially important for the surrounding organisations to show the team that they are working together in collaboration and good spirit.

In terms of content of the communication, the single most important requirement the interviewees placed on the client side is clear goals. Goal setting was especially emphasised by the ST. Interviewees widely agreed that having clear and concrete goals is one of the most important aspects for the team to develop strong CPO and that communication plays a crucial part here. Good goals seem to have an easily understandable end result and limited scope, for example a time frame of six months instead of five years. Interviewees commented that clear goals help the team define clear roles and to feel secure in what is expected of them. This was seen to contribute to both CPO and ability to self-organise. In terms of CPO, nonoptimal goals on the other hand seem to be such that are constantly changing, scope is too big to the allocated time or goals are not sufficiently communicated to the team.

Sudden and overriding changes seem to often make the team feel like they're losing control over the project, affecting CPO negatively. This is why many interviewees emphasise the need for effective communication from the client's part when changes take place, helping the team understand what is happening and maintaining the sense of control. The case company representatives emphasise that the PO has an important role here, staying well on track of the client company's strategy and needs, so that the changes do not come as a surprise to the team. A negative example of this was seen in T3, where the client was said to suddenly demand a change of direction which also came as a surprise to the PO. The members of the team commented that this sudden change affected CPO in the team negatively, including the PO who felt disregarded. While the POs of T1 and T2 agree that oftentimes there is not much they can do to prevent the changes all together, the PO of T1 emphasised that honesty and open communication are essential in terms of CPO, aiding the team to accept the new direction and to rebuild the sense of control.

Another recurring challenge in goal setting affecting CPO is too tight scheduling. This was especially emphasised by the ST. Interviewees view that the teams have some negotiation power over the schedules, and individuals are encouraged by the ST to be honest about their views with the client. In fact, many interviewees emphasised that as consultants, the case company representatives have a responsibility of pointing out if the client's goals are unrealistic and to guide them in a more feasible direction. If schedules cannot be

negotiated with the client and the team members see them as impossible, CPO is likely to be lower, as seen in the comment by S1 about a team with low CPO: “The challenge there was that we were in such a hurry, the original schedules had not yet been changed and getting the project done in time seemed completely unrealistic.” On the contrary, in cases where the project scope and schedules were manageable and teams felt that they could actually achieve them, CPO seemed to be stronger.

All of the case teams seem to feel that their goals and schedules are achievable. While T1 and T2 had to occasionally negotiate the schedules with the client company, it seems that both sides were genuinely trying to reach a common understanding of the constraints they face. As a result, the team members feel trusting and secure, as seen in the comment by T2/M1: “I’d say the client is good, they are reasonable and when we discuss about time frames they understand if it takes longer or if it takes shorter so it’s good, not too much pressure on our shoulders.” In the T3 on the other hand, no clear schedules were set which seemed to actually affect CPO negatively and cause some of the team members feel less motivated than they would have if there was a clear timeline in place. Thus it seems that it is not only too tight schedules that affect CPO negatively, but not having schedules at all might have the same effect. Additionally it appears that having initially strong CPO might actually protect the teams from feeling excessive stress about the schedules, as strong CPO was often commented by the interviewees to make the teams more adaptive and resistant.

In addition to the team gaining clear understanding of the goals and the goals being achievable, having the chance to actively contribute to the goal setting process was recognised by all the interviewees as a powerful way of building CPO within the team. In fact, all interviewees agree that the earlier the team can join the planning process and the more they can contribute in the early phases, the better. All interviewees stress that the client has an important role in either facilitating or preventing the team’s ability to contribute to the goal setting. Allowing the teams’ participation to goal setting seems to be closely tied to trust. When the team is seen by the client as part of the planning process and welcomed to take part in the initial phases of the project, teams often feel a stronger CPO as explained by S4: “If the team feels that they’ve had a say, it increases the commitment to the whole project. It’s like self-made food always tastes good… Although it would not

be any better, but when you've had a say it increases the interest." On the other hand, if the client sees the team as mere resources rather than passionate and resourceful individuals who are able to fully contribute to the project, CPO is less likely to develop.

In projects where the product is to be built from scratch, contributing strongly in the planning is obviously easier and development of strong CPO thus more likely. Even in cases where the initial concept for the product already exists, letting the team to develop it further rather than simply executing a ready made plan seems to increase CPO though making the team feel that they have contributed to the project through their own creative process.

While the client has a lot of power over deciding whether the team is included in the goal setting or not, especially the ST representatives stress that the team members should adopt an active attitude of including themselves in the conversation about the project goals and the reasons behind them. Most of the team members on the other hand seem to think that if the client does not involve the team in goal setting, there is not much they can do about it. Based on the ST comments it appears that teams with strong CPO are more active in raising the issue with the customer if the goals are not feasible. Here, skillful communication and even negotiation skills seem to have an integral role. In an optimal situation, the PO takes on the role of a facilitator, ensuring the information flow between the team and the client company and aiming to guide the goal setting process to a direction that satisfies the needs of both parties.

In all of the case teams the members felt that they can contribute to the goal setting, at least in the short run. The T1 and T2, both with high CPO, had the chance to build the products from scratch. An example of a less successful goal setting on the other hand was seen in T3, where uclear project goals and unexpected changes in the direction of the project were seen to affect CPO negatively. T3/M1 comments on the challenges as follows: "There had been some uncertainty from the project leadership on what is wanted and in what order, which has affected us in the team and caused some frustration… we are doing something and suddenly have to do something else, jumping from one thing to another." According to

one of the T3 members, when the team took some time to clarify the goals and next steps together, the frustration within the team was decreased and CPO strengthened.

In addition to agreeing *what* needs to be done, the ST representatives placed special significance on *why* the project is done, emphasising the understanding of the wider business context and the problems the project aims to solve. Many of the ST representatives emphasise that clear understanding of the wider business context allows the team the freedom to develop the best possible features to fulfill the client's needs. This clearly shows in the ST appreciation for clients who include the team in the conversations and brainstorming on a broad level, as they believe that this kind of engagement is an important part of setting meaningful and motivating goals. While the team members agree that having an understanding of the big picture is important, they placed more emphasis on clear goal setting in the short term. Some even mentioned that as long as they can trust that the project continues and they know what is expected of them in the next six months, more general understanding of the long term goals is sufficient. Some comments from the team members indicate however that understanding of the wider business context is often closely connected to values and meaningfulness, affecting the CPO through that level.

4.2.1.2 Dynamics between the team and the case company

In terms of dynamics between the team and the case company, facilitating goal setting and ways of working were the most prominent themes discussed among the ST representatives. The team members on the other hand underline that the most significant actions the ST can take in terms of CPO take place in the beginning of the project: selling a good project, acquiring sufficient information from the client company, setting the scope and targets for the project as well as selecting the right people for the team. Team members seem to feel that all of these are currently done quite well.

While the teams aim to be as self-organising as possible and view that there is not much the ST can do in terms of the CPO after the initiation of the project, they acknowledge that maintaining good communication with the client and facilitating ways of working when things do not go as planned is valuable. Here there seems to be diverging opinions by the

interviewees, since some of them view the communication towards the client company to be completely the team's responsibility and some expect facilitation from the ST. Just like in the dynamics with the client organisation, open and continuous communication is essential between the team and the case company as it enables the ST to offer the right kind of support when needed.

When it comes to successful goal setting, the ST representatives see their own role as significant. They aim to take an active role in facilitating the goal setting process and making sure the team understands not only what is to be done, but why it is important. The ST sees the goal setting to have such a crucial role in CPO because they believe that firstly, having a clear understanding of when the team has succeeded increases CPO and secondly, being able to contribute to the goal setting increases CPO. The ST aims to facilitate the collaborative goal setting process by encouraging the teams to actively acquire information about the client's business goals and by reminding the client to have these conversations with the team openly and in a participative manner. The team members appreciate the ST's effort in facilitating the goal setting process and see it as beneficial to CPO, especially when the team is actively involved in the conversations. Some team members feel that involving the team members in the sales and planning of the project at an even earlier stage might strengthen the CPO even more.

Apart from the client's goals, some ST representatives suspected that identifying personal development goals within the project for each team member might increase CPO, while others thought that communicating the goals the case company has regarding the project might also translate to enhanced motivation and CPO within the project team. However, none of these goals were mentioned by the team members.

Facilitating agile ways of working is another big theme regarding the dynamics between the team and the case company and was recognised by all interviewees. The ST has set several guidelines and best practises as well as arranged coaching for teams and individuals about agile ways of working. The ST representatives believe that all of these increase the teams' chances of building strong CPO, and that teams might not be able to establish efficient ways of working without their help. While the team members agree that

having someone to facilitate the ways of working in the beginning of the project is helpful, they do not seem to rely on this support as much as the ST deems necessary.

Much of the support by the case company focuses on encouraging the teams to take a more active role in adopting agile ways of working with the clients. As S5 commented: "Proactivity is the key here. Of course we still have clients who are a bit old-fashioned but I notice that it's less and less of those who think than an engineer only does the engineer work, that they don't need to think about anything else. It's more that we have to encourage our people to engage in conversation, to ask and to suggest." The proactivity is seen clearly in T1 and T2 with strong CPO, as willingness or even eagerness to continuously develop the team processes and raising issues to conversation as soon as they are noticed.

When it comes to facilitating ways of working in the self-organising teams, the ST representatives often mentioned feeling unsure what is the appropriate level of support. On one hand, very clear guidelines and best practises are set and teams are expected to follow these, but on the other hand the teams are also encouraged to challenge the current ways of working and to actively look for ways that work best for them. The ST has clearly recognised this mismatch in communication and while they seem to believe that facilitation and support is needed, there also seems to be a fear in place that pushing the teams to work in certain ways might be too authoritarian and thus demotivating. Some comments by the ST representatives even indicated a belief that in self-organising structures, support should not be needed at all. For the most part however, the ST seems to have adopted a coaching approach, thus providing the leadership the self-organising teams need. To be best able to offer this support, the ST representatives call for more active communication from the teams and emphasise that possible issues should be addressed when they are still small. The team members however seem very satisfied with the ST's current level of support.

In the team member's view of the ST role in building CPO, different team building activities were often mentioned to strengthen the team spirit. While most team members recognise it as their own responsibility to organise these events, a few of them seem to be waiting for some kind of initiative from the ST side. In T3, no team building activities have been arranged, which seems to affect the CPO negatively and contribute to the members

feeling that the project is not seen as important by the case company. The interviewees from T3 suspect that having some kind of team building activities might contribute to the sense of CPO.

As discussed in the previous section, the client company often limits the team's autonomy needed for the development of CPO. However, some examples were raised by the ST representatives themselves where they had accidentally reduced the team's autonomy by being too involved. This can be seen in the comment by S5: "If we as ST representatives are too involved for too long, it clearly decreases the team's sense of ownership. That's why I've started to change the way I work, being involved only in the beginning while agreeing the contracts and setting the project goals, but then taking a smaller role in the background." However, as some ST representatives commented, stepping back is not always easy. Even when the intentions are good and the aim is simply to help the team, the efforts might result in lower engagement and CPO. This might happen for example in the trust creation process with the client: while the ST does their best to establish trust with the client, they might actually end up indicating mistrust towards the team.

While the ST aims to facilitate CPO the best they can, it should be remembered that CPO is born within the individuals. Many of the ST representatives recognise that as they are often initiating the project, they tend to develop very strong sense ownership for it. When the project is then transferred to the team, some ST representatives commented feeling surprised that the team does not automatically develop CPO for it. Thus it seems that occasionally the ST representatives confuse their own sense of ownership with the team's CPO. This can be seen in the comment by S4 referring to a team with low CPO in the past: "I couldn't take part in the project after the initiation so… it might be that there was a mistake there, not being able to organise a kickoff and transfer the excitement I had about the project to the team. ...maybe half way through I started wondering why isn't anyone interested in this project, although I thought it was such a cool thing."

4.2.1.3 Dynamics between the team and third parties

When the third parties were not seen to be part of the team, communication and dynamics with them was referred to as “external” by the case company employees. In these cases however, the interviewees had diverging ideas on whose responsibility it is to communicate with the third parties: the PO from the client side, the project team as a whole or someone else. Due to the obscurity about the communication with the third parties, the cooperation with them was often seen as difficult and frustrating by case company employees, decreasing the level of CPO in examples mentioned by the ST representatives.

In T1 and T2, the POs took the role of facilitating the communication with the third parties. Although the communication presents a challenge at times, T1 and T2 reported being able to have open conversations with the third party representatives and planning together with them how the project could be implemented. Even though the communication with the third parties was sometimes seen to delay the work, interviewees mentioned that being able to escalate the issue to the PO and continue with other tasks help the team feel like the project is still moving forward. This support from the PO, making it possible for the team to keep working despite the delays in communication with the third parties seems to protect the team’s CPO.

Based on the interviews it could be summarised that having third party dependencies is not harmful for the CPO of the project team when the communication is sufficiently open and when the PO fully understands and accepts the dependencies. In these cases the PO can aim to facilitate the communication and help the team to proceed with the project by adjusting schedules or reprioritising tasks.

4.2.2.Dynamics within the project team

Another level affecting the teams’ CPO was dynamics within the team. This section includes different aspects affecting the internal dynamics of the team, such as communication, team members' feelings about each other, team composition and ways of working. While the ST representatives clearly wish they could help in creating good

internal dynamics, most of the team members see that good team spirit and ways of working mainly depend on the team itself.

4.2.2.1 Communication in the team

Communication is clearly at the center of team dynamics, since it has strong effects on all the other aspects such as trust and ways of working. This was clearly recognised by all interviewees, as open and active communication within the team was one of the most discussed matters in terms of developing strong CPO. In many of the examples with strong CPO, all parties were part of the team discussions daily and everyone felt that they could voice their opinions and ideas. This is seen in a comment by S1 referring to a team with strong CPO from the past: "Reflecting over the different options together was very natural, if there was a challenge it was natural to think about it together and discuss." The team members emphasised that in teams with strong CPO, the barrier of contacting the other team members and asking or offering help is very low. In T1 and T2 meeting observations all team members contributed to the meeting and engaged in open conversation. The PO of T2 commented that while the team members are very engaged and talkative, the communication feels natural and everyone can be themselves.

In sharp contrast, poor communication was often the first aspect mentioned by the interviewees to affect the teams with low CPO. For example, one interviewee reflected back on a situation where another team member allowed no space for sharing ideas or contributing to the project by constantly disregarding the other's ideas, lowering the sense of CPO. Friction in the team members' relationship with the PO was also often mentioned by the case company representatives to affect information sharing negatively and to make the communication more calculated and limited. As S3 aptly comments: "Communication is everything, I've sometimes thought that this job is all about communication in one way or another. If the communication is successful, the project is successful."

While the team members were very open to having individuals from different cultural backgrounds in the team, some admitted that it is often easier to interact with people who share the same mother tongue. Other team members from developer roles also commented

that it is easier to communicate with other developers due to the similar role and background. Many emphasise however, that making sure that the communication flows in a language that everyone understands is very important for the team spirit, as also stressed by the ST in the training materials.

Interestingly, while some of the interviewees suspected that face-to-face communication would be more effective, the examples of strong and weak CPO presented by the ST didn't seem to depend on whether the communication was face to face or online. The key variable seems to be the amount and quality of open conversation and information sharing within the team, contributing to greater visibility to what others are doing. This, of course, might require some more effort when working remotely, but seems to be completely possible to accomplish. In cases where lack of visibility and mistrust were in place initially, working remotely seemed to make these issues worse, increasing micromanaging and decreasing CPO.

Most of the team members strongly preferred face-to-face communication when possible, at least for the most significant meetings. They commented this to contribute to information sharing about the project as well as increasing informal communication which was said to strengthen the sense of being a team. One very concrete example of a client company facilitating the communication and sense of being a team was mentioned by a team member to be arranging the seating so that the whole team can sit together. Additionally, the PO of T2 emphasised the importance of visiting the case company office often, spending time face to face and getting to know them, especially in the beginning of the project.

The interviewees perceived online communication to be effective for some tasks, but to have the risk of misunderstandings. As the research was done during the year of 2020, the Covid-19 pandemic was forcing most of the teams to work remotely. Teams reported having adjusted to remote work surprisingly well, and for T1 and T2 the communication and team spirit was kept strong. The PO of T1 pointed out however, that while communicating remotely, one needs to pay special attention to the informal communication, such as asking how everyone is doing and connecting with the team

members, instead of strictly focusing on the tasks at hand. In T3 on the other hand, one member reported that moving to remote work has significantly decreased their team's internal communication and increased the feelings of loneliness and disconnection from the other team members.

When referring to teams with strong CPO, many interviewees emphasise the warm, supporting and inclusive ambiance that contributed to the team members feeling psychological safety. This was seen to increase information sharing and tighten collaboration. In an environment with psychological safety team members seem to be more likely to engage in conversation about difficult but crucial issues within the project and challenge each other's ideas and ways of thinking. Taking this kind of active role is seen by the ST to strengthen the CPO within teams.

While psychological safety was mostly discussed in the context of work, some interviewees mentioned that it also makes it possible for the team members to be open and honest if they are having a bad day or dealing with excessive stress in their personal life. Other interviewees mentioned that receiving support from the team members while going through tough times in personal life has greatly contributed to the sense of psychological safety. An environment of high psychological safety was seen in T1 as their PO noticed that the team members often offer each other help, point out areas of development and discuss options collaboratively, genuinely aiming to do what's best for the project.

Acknowledging the accomplishments of their teammates was also seen by the interviewees as something the members could do to increase CPO. Feedback in general came up repeatedly in the interviews and in teams with strong CPO, feedback was given often and in a positive tone. Especially the PO of T1 was very open with giving praise to others, emphasising not feeling the need to be in the spotlight or to get the credit for the team's work.

The above discussed psychological safety is closely connected to trust within the team, a topic that was often discussed by the interviewees and is seen to be essential for development of CPO. In several examples with strong CPO, some team members knew

each other in advance and thus felt that they could easily trust each other, so familiarity clearly plays an important role in trust creation. In other cases with strong CPO, the interpersonal relationships within the team were described by the interviewees to develop to be very friendly, as if being old buddies despite not knowing each other initially. It looks like these kinds of friendly and trusting relationships develop when the team spends time together outside of the working hours and discusses matters of personal life as well, instead of strictly focusing on the tasks.

This could be clearly seen especially in T1 meeting observation, where the PO initiated the meeting by asking some of the team members about their family. In both of the teams with strong CPO, the observed meetings also included greetings in a relaxed tone, sharing pieces of their personal lives and joking. In many of the cases with strong CPO, this kind of trust spanned over all of the team members, including the client and third party representatives. While the ST agrees that they can partially facilitate the development of this kind of environment, the trust creation is seen to be widely dependent on the team members' actions.

Case company representatives explained that lack of trust often leads to micromanaging by the PO's part, affecting the team's internal dynamics negatively. In many cases where micromanaging took place, the team members were reluctant to have dialogue with the client company representatives. This obviously made the cooperation in the team more difficult by reducing internal communication, increasing stress and drawing the team members apart, leading to lower CPO as seen in the comment about a team with low CPO by S5: "Micromanaging always reduces the sense of psychological safety a bit, people withdraw to their corners and it all becomes a bit compulsive. When comparing to a team with strong CPO, where everyone came to the meeting each morning with their coffee cups and smiles on their faces, in this one the ambiance was more like 'oh f***, do I have to go talk to them again?' So the mood was very different."

To summarise the significance of internal communication, teams that had little or ineffective communication often had less psychological safety, unclear or divided roles, tendency to avoid difficult conversations and limited understanding of the larger context

the project was related to, all of which decrease CPO. When open, ongoing, positive and honest communication was in place however, interviewees reported the teamwork to be "tight" and CPO was often strong.

4.2.2.2 Team composition

Team composition in terms of team size, individuals' tenure or team members' cultural background did not seem to have significant effects on CPO based on this sample. However, it seems that when the majority of the team members come from the case company, they are more likely to develop strong CPO. In other words, teams often seem to experience lower CPO in inter-organisational teams compared to the "in-house" teams. Some team members explained this relationship by already having good relationships and trust in place before initiating the project, being familiar with each other's ways of working and already having a sense of belonging in place.

As a result of the above, most ST representatives perceived teams with many case company employees as good and teams with only one or two case company employees as bad. In other words, inter-organisational teams seem to be viewed as a negative or difficult by the ST. This thought pattern seems to suggest that two levels of ownership easily get confused: the level of ownership the case company has of the project and the level of CPO the inter-organisational team feels towards the project. This can be seen in many comments from the ST, discussing whether the case company or the client has more ownership, rather than purely focusing on the team level ownership. It seems that for the optimal end result however, the CPO within the team is what matters and different organisations "fighting" for the ownership might even damage the CPO within the team. Based on the interviews it appears that truly seeing the customer representatives and possible third parties as part of the team is essential for the development of CPO in an inter-organisational context.

In teams with strong CPO all the interviewees reported feeling part of the team, including the POs. For T3 with lower CPO the answers were more nuanced, and while the interviewees somewhat felt like part of the team they commented that none of the team members really wants to belong in this team. A team member from T2 on the other hand gave an insightful answer to the question about feeling part of the team: "yes, sure [I feel

part of the team]! I mean it's [been] one year and a half and we have been doing very well and the customer is happy." This statement seems to reveal some of the leyers behind belongingness, suggesting that it is easy to feel part of the team when one has spent enough time together and when the project has been successful.

While the survey results revealed team members' diverging understanding of the team composition, the interviews indicated that most of the team members felt quite secure about who is part of the team and who is not. Many team members also mentioned that the roles within the team are very clear. This was shown especially in T1 and T2, where most of the interviewees could tell everyone else's responsibilities by heart. While roles within the teams are diverse, many of the interviewees commented viewing all members of the team as equally important.

All interviews agree that having the right kind of personalities in the team affects the teams' chances of developing strong CPO. Both of the strong CPO teams call themselves a "dreamteam" and add that having a good combination of people with different skills in their team makes them feel secure that they can do their best as an independent team. However, as many of the interviewees pointed out, having the right people does not necessarily mean having only similar people on the team, but a certain level of diversity was seen to be positive by most interviewees. Having a good balance of younger and more experienced members was also seen by the case company representatives as something to aim for while constructing a team, as well as having individuals who are willing and able to work cross functionally. The team members seem to feel satisfied with the amount of attention the ST places on selecting the right people to each team, in terms of personal interests, skills and personalities.

While many of the interviewees felt that having a small and compact team would make it easier to develop CPO, there were examples of small teams with low CPO and larger (up to 10 members) teams with high CPO. Rather than the absolute size of the team, each members' understanding of the team composition and their role in it seems to matter in terms of the CPO. When the team members were not sure who is part of the team and who is not or the team composition was constantly changing, CPO often suffered as seen in the

comment by S4 about a team with low CPO: “Maybe one reason that the ownership didn’t develop in that team was that there were several people hustling along, who were not really part of the team.” The same can be seen in T3 where the high turnover rate was said to decrease the team cohesiveness by T3/M2: “None of us knows when we are going to leave the team or change to a different project so… It’s difficult to feel like a team when we don’t know who is gonna be in the team in the long run.”

In terms of feeling like a team, the ability to contribute was often mentioned by the interviewees. Many of these comments referred to internal retro meetings, where each team member can share their ideas on how the teamwork could be developed further. Informal communication and activities were said to strengthen the team feeling as well. Some interviewees mentioned free time activities such as having dinner or going to play beach volley together, but most concluded that ordinary everyday interactions like having lunch together, joking or chatting about common interests before starting a meeting are equally effective. As one team member accurately observes, building a sense of being a team is simply about interactions between individuals in the team, rather than something magical that the team does as a whole.

4.2.2.3 Ways of working

Regarding the team dynamics, commonly agreed ways of working was one of the most discussed topics in the interviews. All interviewees agreed that these improve teamwork in many ways: they enhance the communication, clarify team members’ roles, protect the teams from excessive time pressure, allow each member to use their best abilities and positively affect the team's ability to self-organise. All of these seem to go hand in hand with strong CPO. Although many best practises for ways of working have been identified by the ST, the interviewees emphasise that having the autonomy to decide how to do their work as a team is essential for development of CPO.

According to the ST, one-to-one conversations and daily meetings were said to be the most important practises in terms of CPO. Interestingly, one-to-ones were only mentioned once by the team members and thus do not seem to play such a big role in CPO from their perspective. While dailies were often mentioned by team members as well, they also

placed emphasis on short term planning and goal setting (often in a form of sprint planning) and following agile communications processes such as retros, where they get a chance to discuss how to improve the collaboration in the team. The retro meetings seem to be especially effective in strengthening CPO, as they enable collaborative reflection, which often results in a self-enforcing positive cycle, leading the team to improve and refine their ways of working in each iteration. Many team members recognised the positive effects of continuous development of ways of working on CPO and even mentioned it as an important goal for their team.

Collaborative ways of working were often mentioned by the interviewees and they emphasised that strong collaboration is a significant factor in developing CPO. All of them agree that collaboration is definitely needed in the software development projects due to their cross functional nature. If cross functionality and collaboration is lost, CPO is often missing as well, as seen in the comment by S1 reflecting back to a project team with low CPO: “Each member just pushed their own thing and… I don't know if they felt ownership for that task but it looked like there was no shared ownership for getting the whole thing done. It was more like ‘I just do this’ and if the whole thing doesn’t work people are like ‘I did my task, that is someone else's responsibility, it’s not my fault.’”

Many of the interviewees emphasised that continuous and open communication within the team is essential in keeping the work genuinely cross functional and note that too tight schedules might lead to decreased communication and collaboration. They also commented that collaboration leads to a better end result, because bringing all the ideas and different ways of solving the problems together often results in more sophisticated solutions. As one interviewee puts it, no one should take a role of the “star of the show”, but it should genuinely be a team effort.

Challenging each other's ideas and actively looking for the best solutions together are some of the ways in which teams with high CPO collaborate. For example, a member of T1 commented that while they sometimes disagree, they disagree with the ideas, not with their teammates per se. Here the interviewees emphasise the importance of trust between team members which enables the conversation about conflicting ideas without feeling

threatened, leading to discussion where the aim is to genuinely find solutions that best serve the project. The interviewees emphasise that while some of the conversations can be difficult or uncomfortable, not shying away from them and honestly voicing one's opinions are crucial for the development of CPO. Encouragement to challenge each other's ideas also comes from the ST side and was seen in the interviews as well as the training materials. Thus it could be summarised that collaboration does not always mean being amenable to all the team members' ideas, but to collaboratively utilise each members' capabilities in the best way possible in service of the project.

Closely connected to collaboration is the team members' ability to contribute to the project. As one of the team members pointed out, development of ownership takes time and starts to build when an individual has sufficiently contributed to the project. Over time, as the interviewee explained, the project starts to feel like "my project too." Similar experiences could be seen on the collective level, as the team members explained that being part of the project planning or making big decisions in the project strengthened the team's CPO. Through making significant contributions to the project, the team members report feeling that they can fully invest themselves in it and use their full capabilities. These contributions can be either abstract (like ideas) or concrete (like writing a piece of code). In cases where the team members did not feel that they could fully contribute to the project, the reason was often mentioned to be limited autonomy due to lack of trust by the client representatives part or third party dependencies.

A good example of enabling contributions was seen in the observation of the T1 meeting, where the team beautifully facilitated the situation by inviting contributions from the newest member of the team. In other examples, the PO, team lead or the ST representatives took the role of making sure everyone has a chance to contribute. The team meetings were also often structured in a way that everyone can have a say. One way of doing this seen in T1 and T2 meeting observations was using a shared document where everyone could first write their notes in silence, and only after having everyone's opinions written down were they discussed.

While discussing the ways of working, being able to follow the progress towards the project goals was often mentioned by the ST representatives. In their examples of past projects with high CPO, the progress was often clearly visible. Clearly seeing the progress was emphasised by the ST representatives to increase the understanding of the big picture as well as to enable the team to make changes in real time if the project is not on track, which in turn could be seen to increase their sense of control over the project.

4.2.2.4 Shared sense of responsibility, control and accomplishment

Shared sense of responsibility, control and accomplishment are all important for the development of CPO and it seems that all of these are affected by the ways of working. Firstly, each individual carrying their own responsibility in form of completing the agreed tasks and being a good team member was seen by the interviewees to be essential to the CPO of the whole team. Many interviewees suggested that one way to facilitate CPO might be to identify an individual area of responsibility for each of the team members. However, as one of the ST representatives observes, responsibility and ownership are not equivalent and they are sometimes confused with each other: giving responsibility does not automatically lead to development of ownership.

Many team members connected the shared sense of responsibility to the size of the team, suggesting that the bigger the team, the easier it is for the individuals to start feeling that they do not have to carry that much responsibility. According to them, when the team is small, everyone feels that they have to do their part, as can be seen in the comment by T2/M2: “It’s funny that as we are quite few, we all feel that we are together responsible for the whole thing.” The sense of responsibility was often mentioned by the interviewees to increase perseverance, showing in for example trying to find ways to effectively communicate with the third parties even when it is challenging.

Sense of shared responsibility seemed to be higher in T1 and T2 working with clients, compared to T3 working on an internal project. The content of the work seemed to play a role here since the projects done for clients were perceived as more serious or important. However, even in the T3 with lower overall CPO and lower sense of shared responsibility, the interviewees commented that team members’ sense of responsibility for their own

individual tasks was high. This was also seen in the survey results. In contrast, teams with high CPO clearly indicated a sense of shared responsibility, emphasising that delivering a good product is everyone's responsibility.

In terms of feeling in control, the team member reported that the sense of being in control as a team is strong when the team is able to follow the agreed ways of working and especially when finishing a sprint or reaching milestones in the project. Many team members also reported feeling in control when they were able to contribute to planning within the project or when overcoming challenges as a team. The challenges, while stressful when they happened, were seen by many of the interviewees to strengthen the team spirit and to give a sense of control and accomplishment when overcome, all of which seem to contribute to CPO.

Not feeling in control seems to be connected to lowered CPO within the team. For POs, not understanding all of the development tasks and their workloads can be a source of not feeling in control, while some of the team members commented that not understanding why the client company makes certain demands contributed to not feeling in control. Some team members also commented that the PO might limit the sense of being in control by not giving the team enough autonomy or by continuously changing the focus.

Viewing the PO as part of the team seems to also make a big difference in terms of the sense of control, which is clearly seen in the comment by T1/M1: "Well, considering that [the PO] is part of the team I think we're always in control!" In T2 on the other hand, where some of the team members viewed the PO as separate from the team, they felt less in control according to T2/M1: "The customer is the person who decides what to do and what not to do. So there is always a bit of lack of control." Thus it seems that open communication between the PO and the rest of the team as well as truly accepting each other as part of the same team could increase the sense of control and through that, the CPO in project teams.

Lastly, in almost all interviews with the team members, the sense of accomplishment and sense of control were strongly linked together. Being able to present the progress to the

client company in the form of demos was seen as a good practise and something that gives the sense of control and accomplishment. Additionally, getting good feedback from the customer and good reviews from the users of the product was said by the team members to create a sense of accomplishment, contributing to the sense of self-efficacy and through that the CPO.

4.2.2.5 Role of the PO in team dynamics

It seems clear that in terms of team dynamics, the PO has the most influential role in facilitating or eroding teams' CPO. According to the interviewees, the PO should be accepted as part of the team, have strong interest towards the project, communicate clear vision to the team, have decision making power and authority over the project budget, create warm and open relationships with the other team members, protect the team from outside disturbances, ensure the team has everything they need to work efficiently, be skillful in facilitating the goal setting process in a participative manner, prioritise the tasks, manage communication between different parties and keep the team up to date about the customers business needs and larger strategic context. These kinds of PO's are clearly few and far between, since all of the above is a lot to be asked from one person.

One of the most important skills for the PO appears to be the ability to create a strong and compelling vision for the team to feel ownership for, while allowing space for each team member to contribute to the conversation and ideation process of how to get to the commonly shared vision. This was seen clearly in a comment by S2 about a past project where the team developed strong CPO due to the PO's actions: "The client took the role of a facilitator, and of creating a vision… but she was in no way a tyrant that would silence people. So she facilitated a culture of contribution very skillfully so everyone got their voice heard and could feel ownership through their own know-how."

In both of the teams with high CPO, the POs were very competent and experienced in their role. This seems to bring a certain calmness and steadiness, reducing overreactions as the PO of T1 comments: "If things go wrong I'm not so panicked and if things go right, I'm not overly excited." The same PO also showed a great example of building a shared vision, while emphasising the trust towards the team, giving them the autonomy to strive towards

the goals in ways they see fit. The POs of T1 and T2 clearly took on the role of clarifying the roadmap and prioritising the tasks. They also aimed to facilitate the work within the team, making sure that everyone knows what to do and that each member has access to all necessary information. Team members from both teams report having a clear understanding of the direction of the work for the next few months, so the POs have clearly been successful in their role. Both of the POs also demonstrated having a growth mindset and acknowledged that they do not know everything. This led them to ask for help and clarification when needed and being open to the team's feedback.

Sometimes PO's actions can affect the CPO negatively. According to the interviewees it seems that this is more likely to happen if the PO is inexperienced or prone to micromanaging. In T3 for example, the PO affected the team's CPO negatively by not clarifying the direction of the project, continuously jumping from one priority to another, emphasising short term results without clarifying the larger goals first, not taking time to have the important conversation with the team and by placing unnecessary pressure and stress on the team. As a result, the T3 interviewees did not seem to be sure about the direction of the project.

One of the most important roles of the PO seems to be balancing the needs of the client company and the team. This often includes negotiations about the schedules, priorities and overall content of the project. In addition to negotiation, balancing the needs of the different stakeholders seems to often require simply facilitating information sharing. In T1 and T2 the POs were doing this actively by constantly connecting the team to the client organisations business needs, keeping the team up to date about the overall situation as well as managing the communication with the possible third parties.

When it comes to goal setting and schedules, the POs of T1 and T2 were observed to ask the team members' opinion before deciding final timeframes. In fact, one of the POs even emphasised that it is the team's responsibility to speak up if the goals are not achievable. This process clearly requires negotiation skills from both sides, as well as open and honest communication. It looks like most of the time conflict is inevitable, as the client wants the work done as fast as possible and the team wants to ensure sufficient time to deliver a

quality product. It seems that in these situations the PO is often under great pressure from both sides. The PO of T1 seemed to accomplish this quite well, which might be due to not being so attached to the employing organisation: the PO in question had been hired for this specific project, while the PO of T2 had made a long career in the field and seemed to be strongly emotionally attached to the employer.

The PO of T1 acknowledged that in fact, often the goals are not possible to reach, and that IT projects always tend to be late. The POs explain that changing business requirements and third party dependencies are the biggest reasons for this. Interestingly, one of the T1 members reported feeling that the goals are completely achievable. Another team member from T1 explained that it is the PO's responsibility to worry about the schedules and discuss them with the client organisation, and that although requirements might change, the team just aims to work as fast and as well as possible. Therefore it seems that in T1, the PO has succeeded in protecting the team from excessive stress about the schedules.

While the PO's skills certainly matter, the relationship with the team plays a big role in development of CPO as well. One of the most significant factors seems to be whether the team sees the PO as part of the team or not. In many teams with low CPO, the team saw the PO as an outsider and not part of the team, while in teams with strong CPO the PO was generally seen as part of the team. Having the experience of being part of the same team seems to also increase psychological safety in the team and aid more open and honest communication. Identifying the PO as part of the team obviously has much to do with the other team members' attitude, but the PO has power in this as well. The PO of T1 for example had communicated the expected attitude and established everyone as part of the same team in the beginning of the project with the following words: "I'm very focused on what I'm doing and I hope you share the same view. We're building something together, so let's be proud of that."

In accepting the PO as part of the team, it seems that the PO's personality and the way of communicating play a big role: the team must like the PO to be willing to accept him or her as part of the team. In many teams with low CPO, team members felt uncomfortable or even scared to talk to the PO. An example of this was seen in T3, as one of the team

members explain that they have to set their words carefully to avoid offending the PO. As a result, the communication with the PO was not as open and fluent as it could have been if the relationship was better. Other interviewees gave similar examples from past projects as well, where not liking the PO had led to avoiding conversations and engaging in unproductive arguments, rather than focusing on what's best for the project. One of these situations was well described by S1, commenting on a past project team with low CPO: "I think that sometimes we were even avoiding the PO… in addition to the PO, the client had hired a project manager who understood software development much better. So the communication was much easier with that person and I noticed that we were drawn to have most of the discussions with him and contacted the PO only when we had to, which was a bit absurd."

As presented above, the requirements placed on the PO are complex and few individuals possess the optimal set of skills to succeed in this role. To help close this gap, the ST aims to coach the POs about agile ways of working and encourage the teams to adapt a coaching role with the clients as well. However, the comments by the ST indicate that effectively coaching the client has presented a challenge. One interviewee speculates that insufficient psychological safety might play a role here, as the PO might not be open for conversations about changing their ways of working unless they feel psychologically safe. As seen in the previous sections, psychological safety is also crucial in terms of open communication and close collaboration. Because of this, it's not only important that the team accepts the PO as part of the team but that the PO *feels* accepted as well. The team has the most power in making the PO feel accepted in the team, for example by inviting the PO to take part in the team's free-time activities, as mentioned by one of the interviewees.

4.2.3. Team members' personal level

The third theme identified from the data affecting CPO was the team members' personal level, regarding internal thoughts, feelings, attitudes, personality traits, values and so on. While focusing on the personal level, the interest was in understanding what kind of aspects on the team members' personal level affect the team's CPO, rather than solely focusing on psychological ownership on individual level. However, it must be kept in mind

that as CPO is an extension of individual ownership (Pierce & Jussila, 2010; Verkuyten & Martinovic, 2017), the individual level cannot be left without attention.

All interviewees believe that everyone is capable of feeling ownership. However, many of them specify that not everyone can feel ownership of the same aspects of the project or on the same level. For example, many ST representatives suspect that the developers might not be as interested in the success of the case company as they are in the functionalities of their code. Some interviewees comment that the ability of developing ownership develops with time and with experience, but as seen in the quantitative results, no correlation between the tenure and CPO was found in this sample.

Individuals' understanding of their own role in relation to the goals and larger context was brought up often by the ST representatives as an important building block of ownership. According to them, a clear goal setting process aids this understanding, helping the individuals feel secure in what's expected of them. This was shown in many examples of past project teams with strong CPO, as seen in the comment by S5 describing a past project where strong CPO was in place: "Everyone knew and felt very clearly what their own role was. So the first thing is the clear goal, supportive and positive environment and then from there everyone's roles emerge really naturally. That helped in making the teamwork smooth and very straightforward. There were no questions of 'what should I be doing?' The self-organising was very strong." On the contrary, in teams with low CPO roles were often said to be unclear.

Another aspect affecting CPO on an individual level seems to be the ability of being proud of one's work. The interviewees comments about pride were mostly related to the significance or importance of the project. Projects that had to do with creating something completely new or were ordered by big or visible clients were often seen as more significant and often led to higher CPO. Based on the team members' comments, the sense of meaningfulness is increased if the client company indicated the project being crucial for their strategy. Within the project, the type of goals was also seen by the interviewees to affect how proud the members would feel.

Many ST representatives saw it as their responsibility to facilitate the goal setting so that the team members could feel proud of what they are working on. The PO of T1 also recognised the importance of feeling proud and emphasised wanting to make sure that the team members feel accomplished and proud of their work. However, the sense of pride was not seen to be solely dependent on the project itself, but many interviewees reported that personality matters as well, as many interviewees mention that some individuals feel a sense of professional pride and accountability easier than others.

The aspect of pride is closely connected to values and the experience of meaningfulness, which were often mentioned by the interviewees to have a significant effect on CPO on an individual level. Meaningfulness was often connected by the interviewees to either team members themselves or someone in their social circle directly benefiting from the product being developed, or the project having a wider societal impact. On the other hand, the interviewees recognised that each individual is most likely to see different things as meaningful and worthy of developing ownership for, so the whole team might not feel CPO in the same way.

The ST representatives were very much aware that if the team members' values don't match with the values of the client company or the project, ownership will not develop. A good example of a project where the personal values and the project values conflicted and this mismatch negatively affected the CPO was given by T1/M1 while reflecting on a past project: "We did not believe in the product itself so it felt like we were working just to get paid. ...the whole idea to me, it was super silly. And the way it was trying to be profitable, was not… fair even."

While most team members acknowledged that the ST pays careful attention to matching the project with the personal interests and values of the individuals, some mentioned that placing even more weight on this might help in development of CPO. However, as some of the interviewees mentioned, options are not unlimited and making a perfect match between the project and each individual's interests is often impossible. This can be seen in T3, which is working on an internal development project while waiting for a suitable client case. Although they agree that the goals of the project are good, the CPO seems to be

lower than in other teams, possibly because according to their comments, they do not seem to view the project as important or meaningful. While matching the team members' personal values and sense meaningfulness with the project topics is a powerful way of facilitating CPO, they are not enough to ensure the development of it on their own. This was seen in several interviewees' comments referring to past projects where the initial interest and enthusiasm from the individuals was high, but was then lost due to the nonoptimal ways of working or nonoptimal communication with the customer.

For many of the ST representatives, their own experiences of feeling pride and strong CPO were related to projects for customers that were significant to the case company, in terms of size or visibility. This might of course be more pronounced among the ST representatives, as many of them are in management positions and most likely feel strong ownership for the case company as a whole. This was demonstrated well in a comment by S4 about a past project team with strong CPO: "It was quite a big client and the visibility we could reach felt unimaginable. We hadn't done things on this scale before, so it felt like we have to do this well, like it could be a ticket to the next league somehow." Some ST representatives suspected that the project's significance for the case company might increase the CPO in teams, while others seemed certain that the team members would not care about the business implications. None of the team members directly mentioned that clients that are significant for the case company would lead to higher CPO, but many commented that working on a project that is very visible or has a big impact on the society might increase CPO.

The experience of being seen as complete, resourceful and dynamic individuals seems to play a role in development of CPO as well. In the case company representatives' examples about teams with low CPO, the client representatives were often mentioned to see the individuals as mere resources, like a pair of hands that are just supposed to execute what is being said. S3 commented on a past project team with low CPO explaining this challenge: "Even if a developer has good ideas, they are not listened to. So viewing the individuals like they were workers in a factory 'you just do what we tell you to do, don't think', maybe this is what kills all of the ownership." According to the interviewees, in teams with strong CPO on the other hand, individuals felt heard, appreciated and accepted as they are, even

being able to express if they were having a rough day or otherwise feeling low. While ST clearly does their best to facilitate this, much of the responsibility of being seen as a whole instead of just accepting the role of implementer is placed on the individual.

The opportunities for personal growth, learning and development were also often mentioned by ST representatives as aspects affecting psychological ownership on an individual level. However, many of them seem to feel that they have not paid enough attention to this and wish to facilitate individual learning better in the future, for example through one-to-one sessions. Outside of the projects, the case company organises training and different ways of supporting individuals' learning, but as is emphasised in the internal training materials, much of the learning should happen within projects and in collaboration with more experienced colleagues. Some of the ST representatives seem unsure how to support this, because the pressure coming from the customer side to deliver high quality results quickly is often strong, and learning new things might be in conflict with this. Most interviewees agree however that it is largely the individuals' responsibility to be proactive when it comes to learning.

While the team members agreed that learning is motivating and might increase CPO, the topic did not come up as much as among the ST representatives. Some of the team members suggest that using pair programming could be a good way to learn new things without compromising the project quality, while most agree that code reviews - which seem to be in place in all of the teams - is the best way to learn new things within a project. Many team members add that if they are doing a code review for a less experienced colleague, they might pay special attention to doing it with much care and clarity, for maximal learning. Code reviews done by the other team members are seen by the team members as beneficial for learning, but also as an essential part of the development process, making sure that the end result is of high quality. One team member also commented that by reviewing the code of others, one gradually develops CPO for the whole project, instead of just a small section of it.

In T3 where one of the main goals was learning itself, the team hosted meetings where each member could share their learnings with others. The team members viewed this as a

good practise, but it was not continued after the majority of the work was changed to remote work due to the Covid-19 pandemic. While CPO in T3 seems to be lower than in the other case teams, it appears that learning new things is one of the main motivators and keeps people somewhat engaged.

The PO of T1 acknowledged learning as important for CPO, especially for young people, and aims to facilitate it by encouraging the team members to try new things within their work. The PO of T2 on the other hand, while acknowledging the importance of learning for the motivation of the individuals, pointed out that as a client they buy certain capabilities. Because of this, as commented by the PO of T2, the PO's possibilities of facilitating learning are very limited. The same PO continued however that giving the individuals the space to work on different aspects of the projects and on slightly varying tasks is surely better for the learning than strictly limiting the area of responsibility to a very narrow task.

The effects of personality traits were often mentioned by the interviewees, suggesting that some kinds of personalities take ownership of projects easier than others. From the team members' perspective, some even saw the right kind of personalities as the most important aspect in terms of CPO. Part of the ST representatives emphasised the importance of having sociable personalities in the team, to facilitate the development of a good team spirit, which helps in development of CPO as seen in the comment by S5: "In some teams there is a delightful amount of personalities who build the team spirit and belonging also outside of the work, going to play beach volley or whatever... Some are very talented in this and it surely increases the CPO because it increases the sense of openness and the willingness of people to be part of the team."

Other traits affecting CPO mentioned repeatedly by the ST representatives were high work morale, the ability to adapt to changes, eagerness to take responsibility, selflessness, positivity and being determinant. Many of these were highlighted by the team members as well, accompanied with friendliness, respect, proactiveness and willingness to help. Not only the tendency to help others but also feeling secure that help is available by the other team members seems to strengthen CPO. Proactiveness on the other hand was often

mentioned by the interviewees to show as team members' readiness to raise issues to the discussion, even if they are not directly in one's area of responsibility. The PO of T2 emphasised that all organisations surrounding the team can facilitate the culture of proactivity by encouraging the team members to share their ideas and opinions. Arrogance or selfishness on the other hand were seen by the interviewees to erode CPO as well as strictly focusing on one's own tasks and refusing to help others.

In addition to the personality traits of the individuals, the so-called personality fit was also discussed often by the interviewees and said to positively affect CPO through easing internal communication, as explained by T1/M1: "There's this kind of connection we have, we don't even need to talk that much… we are aligned somehow, we all want to go in the same direction ...we are super different but it somehow matches, we respect each other and each other's ideas, we all want to make things work properly and we are friendly... I don't know, I guess when you combine all of those together then it's.. Yea, it's super nice!" As seen in the quote, having a good personality fit doesn't necessarily mean having similar people in the team. The same interviewee added that CPO might not always be easy to achieve, since it requires "feeling at home" with your teammates, which is only possible when good personality fit and high level of trust are in place.

5 Discussion and analysis

In this chapter, the results of the research are discussed in the light of the previous research relying on the framework presented on page 32. Furthermore, five steps identified to facilitate the development of CPO are introduced and explained. Suggestions are given for those aiming to facilitate the development of CPO in self-organising, inter-organisational teams.

5.1 The results in light of the previous research

The results are in line with the notion by Pierce & Jussila (2010) that CPO is unlikely to develop without first developing a sense of ownership at an individual level. However, it should be kept in mind that solely relying on individual ownership developing to CPO when a team is put together is not sufficient, but CPO should be actively facilitated.

The results confirm the notion by Pierce & Jussila (2010) and Cohn (2018) that CPO is more likely to emerge in self-organising environments. In fact, the results are even in line with the more radical suggestion by Pierce et al (2018) that CPO is one of the ways teamwork produces superior results. As marked in the framework on page 32 based on the previous literature, the results show that self-organising strengthens CPO in all the identified areas: dimensions, routes, context factors and boundary conditions. On the other hand, teams with high CPO seem to be also more prone to self-organising. Based on this it could be concluded that self-organising and CPO are mutually reinforcing. The downside of this close connection seems to be that if CPO or self-organising is low, the other is likely to decrease as well.

In terms of inter-organisational teams, the development of CPO seems to be challenging as deemed based on the previous research (Conboy & Morgan, 2011; Gemunden et al, 2005; Puumala, 2017) and as seen in the framework on page 32. In the context of this research, the main reasons for this seem to be lack of trust and lack of open communication. These often seem to occur when the case company employees and other team members see themselves as separate and not part of the same team, often ending up fighting over the

ownership of the project or reinforcing the boundaries between “us” and “them.” Thus truly accepting each other as part of the same team, closely connected to the boundary conditions of collective identification and team chemistry and cohesiveness, is one of the prerequisites to CPO. If this mindset is not achieved, the teams are likely to experience the inter-organisational collaboration as limiting and restricting their autonomy, just as Puumala (2017) and Conboy & Morgan (2011) have suggested.

Not accepting each other as part of the same team often leads to a dilemma in terms of CPO: When the case company employees want ownership to themselves, they should be able to travel down all of the routes affecting CPO identified by Pierce et al (2001) together as a team. However, this is not possible in an inter-organisational project, where the client representatives possess much of the information and control over the project. The same applies other way round, as the client representatives are not able to travel down all the routes affecting CPO without the help from the rest of the team. However, when the members from different organisations truly accept each other as part of the same team and aim to gain ownership together, they are likely to be able to travel down the routes of CPO together.

To avoid this dilemma, an important mental shift needs to happen on the ST level: the attention should be changed from aiming to gain ownership for the client company to aiming to facilitate CPO in the inter-organisational team. Too forcefully driving the client company ownership seems to be damaging for the CPO within inter-organisational teams. If in an inter-organisational project each organisation aims to build strong ownership on an organisational level, it can easily drive the team members further away from each other and deteriorate CPO in the team.

Since it looks like traveling down the routes affecting CPO is largely dependent on the fulfillment of the boundary conditions, special attention should be paid on these while aiming to facilitate CPO in the context of self-organising, inter-organisational software development projects. The dimensions and context factors identified by the previous research are clearly present in the results and affect the CPO as well, but seem to be

somewhat less dependent on the boundary conditions. They often seem to be connected to the routes, each making traveling down the routes easier in their own way.

After having gained deeper understanding on the development of CPO in this context, few adjustments to the framework were made regarding the inter-organisational structure's effects on CPO. Firstly, the effect on the ability to control the target seems to have the potential to be positive, if all team members from different organisations develop strong trust and see themselves as part of the same team. Secondly, the effect on coming to intimately know the target seems to be purely positive, since two organisations always have more information about the project compared to one, regardless of how much of it the other party decides to share. Lastly, the effect on collective identification seems to be mostly negative compared to in-house teams. These reconsiderations to the framework are circled in figure 7 below.

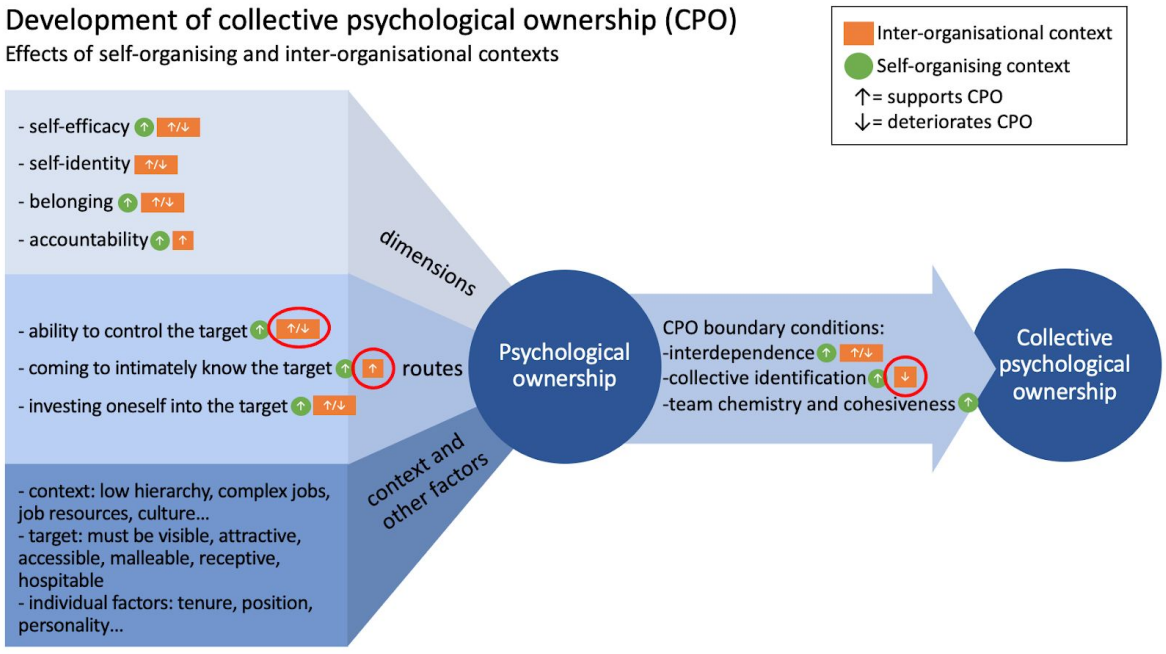

Figure 7, reconsideration of the conceptual framework

As the results revealed, much of the development of CPO depends on communication and interactions between different individuals. Because of this, special attention should be placed on the communication practises and coaching of the case company employees to be skillful communicators. The importance of communication for CPO highlights the

statement by (Pierce & Jussila, 2010) that while the development of IPO only requires person-object interactions, the development of CPO additionally requires having interactions between individuals as well as witnessing other individuals interacting with the target of ownership, in this case the software development project.

In all of the communication, it should be kept in mind that CPO is a feeling (Pierce & Jussila, 2010), rather than something concrete. Because of this, a great importance is on how the communication makes the team members feel and whether or not it helps them to reach the steps described below. Paying attention to the communication and the way it makes all members feel seems to be even more important when working remotely, since in online communication the interactions often tend to lose depth and less attention is paid to the wider context and creation of interpersonal, trusting relationships.

While the case company's employees' feelings certainly matter, it should be kept in mind that the ST has very limited control on how the representatives of the other organisations act. They do have control over their own actions however, and to a certain extent the actions of their employees, so paying attention to how the case company representatives make the other team members and stakeholders feel is likely to have more leverage than solely focusing on how the client and other stakeholders make the case company employees feel.

In terms of facilitating CPO, the ST is clearly trying to find a balance between allowing the teams with the needed autonomy while providing the support needed. This is certainly an important aspect to keep in mind, as Cohn (2018) notes that different teams should be able to self-organise differently. However, the ST representatives have noticed that CPO often requires facilitation and support to take root. Their continuous reflection on the role of leadership in this context has clearly yielded results and the case company has already established many practises that support the teams in an optimal way while not limiting their autonomy.

While many of the comments by the ST representatives indicated feeling afraid of being too active in offering support to the teams, engaging in active coaching should not hurt the

teams' autonomy. As widely emphasised in the previous literature (Grundström & Söderman, 2020; Laloux, 2016; Parker et al, 2015; Pisano, 2019; Richter et al, 2011; Stray et al, 2018), even self-organising teams need supporting structures and leadership in a coaching from. A good way to do this could be facilitating reflection by asking open ended questions instead of giving direct tips or suggestions. Fortunately, much of this attitude seems to already be in place in the ST.

5.2 Five steps contributing to development of CPO

Based on the combined knowledge from the previous literature and the results of this research, five steps for the development of CPO were identified. These steps are closely connected to how the team members are feeling and could be characterised in the following manner: 1) "I know what this project is about," 2) "I want to be part of this project and this team," 3) "I feel comfortable working in this team," 4) "We can do this together" and 5) "We are doing this together." For a strong CPO to develop, each of the team members should take these steps, including the client representatives and possible third parties. While each step is necessary to be able to proceed to the next one, they are by no means linear and should be taken iteratively. This is in line with the notion by Pierce et al (2003) that psychological ownership develops iteratively. While much depends on the client and other team members, all of the steps can also be facilitated by the ST or the team members from the case company side.

5.2.1 Step 1) "I know what this project is about"

The first step towards strong CPO is each team member knowing what the project is about. Here, the route of coming to intimately know the target is combined with the dimension of self- and collective efficacy (both identified by Pierce et al 2001), supported by the context factors of the target being visible and in some cases tenure, both identified by Pierce et al (2003). This step is an important starting point for the development of CPO, as it lays the bedrock for all the other steps and allows the individual to start building the connection between self and the target, as noted by Pierce et al (2001).

The route of coming to intimately know the target is especially visible in the goal setting process facilitated by the case company, as each of the ST representatives underlined the importance of the team members knowing what is supposed to be done and why. This is an area that the ST seems to have succeeded well, as many of the team members feel very confident in what is expected of them. Thus the lack of common goals and vision, - one of the biggest challenges identified to self-organising teams (Aghina et al, 2018; Hoda & Murugesan, 2016; Moe et al, 2008; Savaspuro, 2019; Stray et al, 2018) - seems to be well tackled in the case company. Furthermore, when each member knows what is expected of them, they are likely to feel more confident and able to succeed in the project, contributing to enhanced self-efficacy.

As discussed in the results, the PO is an important link in communication between the team and the client company and thus has a significant role in facilitating the first step by providing the team with all the necessary information about the project and its context. On the other hand, it should be remembered that the client representatives are team members as well, so the rest of the team should equally make all of the relevant information available to them as well as to possible third parties, to achieve a state where all of the team members have sufficient information about the project.

It seems that first hand experience is a much more effective way of transferring information than written reporting, so involving the team in the planning of the project is a powerful way of ensuring the team not only has the necessary information in theory, but also feels that they know what the project is all about. Here the ST has much of the power, since they are often the first ones starting to plan the projects with the clients. Openly sharing information and knowing what the project is about and where it is going is not only important in the beginning, but this knowledge should be continuously refreshed by open communication between all parties, as emphasised by Conboy & Morgan (2011) and Gemunden et al (2005). The information sharing and sensemaking should not be only limited to the project tasks, but should involve a wider client context as well, as Olckers & Du Plessis (2012) emphasise. This is shown in the results by increased sense of meaningfulness, when the connection of the daily tasks to the bigger purpose is clear.

While this can be partially done in the beginning of the project, it seems that the deeper understanding of the wider business context develops gradually through the work itself.

Although the previous literature by Pierce et al (2001), Olckers & Du Plessis (2012) Ozler et al (2008) and Pierce et al (2003) suggest that longer tenure leads to stronger CPO through having collected more information about the target and many of the ST representatives suspected the same, the results do not support this idea. This is likely due to the target of CPO being the specific project rather than a whole organisation. Thus, the individuals who have longest tenure in the specific project are likely to have stronger CPO through having collected plenty of knowledge about that particular project.

5.2.2 Step 2) "I want to be part of this project and this team"

The second step combines the dimension of self-identity identified by Pierce et al (2001) with the boundary condition of collective identification (Pierce & Jussila, 2010). Additionally the context factors of organisational culture and attractiveness of the target are in play here. Fulfilling the boundary condition of collective identification seems to also deepen the knowledge about the project (step 1), in terms of who is in the team, what are the areas of responsibility as well as through acquiring more information about the project itself through the other team members.

During this step, the individuals evaluate whether they want to identify themselves with this project and this team or not. This evaluation cannot be done without first taking step 1 and having enough information about the project and the team. If the individuals perceive the topic of the project and other team members as welcoming and interesting and the project is in line with their values, they are likely to feel that they want to be part of it. The project being socially esteemed, successful or widely impactful also increases the individuals' willingness to be part of it. As Pierce & Jussila (2010) point out, to feel like something is "ours" one must first know who is "us" and want to belong in that group. Because of this, it is not sufficient to be interested in the project itself but also to find the team interesting and welcoming. This could be seen to be connected to the context factor

of attractiveness of the target identified by Pierce et al (2003), noting that one only wants to identify with and belong to something they find attractive.

On the other hand, as Pierce et al (2001) note, individuals use possessions to build their identity, so conflict between individual and project values can prevent the individuals from emotionally attaching themselves to the project. In these examples, as the results revealed, the individuals did not want to identify themselves with the project or other team members due to the project being silly, overly optimistic, against their values, unimportant, or due to the other team members not being welcoming.

Wanting to be part of the project is also clearly connected to the "personality fit" that many of the interviewees emphasised as well as the organisational culture: if the organisational culture of the client significantly differs from the organisational culture of the case company, the individuals might not find the collaboration appealing. Similarly, while diversity was generally seen as a good thing, if personalities were too different or otherwise clashed, the CPO was likely to be lower. Familiarity seems to make teams more attractive, so facilitating the relationship building and informal conversations within the team is likely to strengthen CPO. Familiarity can be found in simple things, such as having the same hobbies or having grown up in the same city. Thus, making sure the team members find common ground can be an effective way of increasing familiarity and through that the willingness to be in the same team, contributing to CPO.

As mentioned above, having the right kind of personalities in the team can make the project appear more appealing. While personality cannot be greatly affected, the way in which individuals perceive each other can. For example, the ST representatives seem to often frame the client representatives and possible third parties as difficult or "different than us." Because of this, some of the ST representatives seem to have a negative mindset toward inter-organisational teams. This might unconsciously affect the mindset of the team members that represent the case company and reduce the chances of the team to create a truly open and trusting working relationship with the client and other parties.

Collective identification might present a challenge in inter-organisational teams, especially if the team members do not work from the same physical location. According to the results, in teams with low CPO the case company representatives do not fully identify or accept the client representative or other parties as part of the team. As suggested by Gray et al (2020), the PO can facilitate the collective identification by making the team boundaries visible: who is in the team and who is not. The PO can also actively position him or herself as part of the team by using inclusive language (for example talking about "us" instead of "I" and "you"), and make the project appear more attractive to the team by showing his or her own passion and commitment towards it (Gray et al, 2010). Thus, the PO should be passionate about the project and not overly passionate about the client company, just as the team members on the case company side should be passionate about the project instead of aiming to win ownership for the case company.

Based on the results it seems that it is easier for the PO to position as a strong part of the team if he or she is not overly attached to the client company. This also seems to help the PO to deal with the pressure of balancing the needs of the team and the client company. It could even be suggested that using POs that are only employed to complete the current project and are otherwise not attached to the client might lead to more harmonious teamwork.

Although collective identification is an important part of step 2, having differing opinions about the team composition did not seem to significantly affect CPO in the case teams. This was a surprising finding and partially against the previous literature by Pierce & Jussila (2010). It seems that while accepting the client as part of the team and having a clear understanding of who else belongs in the team is important for CPO, differing views on the team composition between the members does not automatically lead to low CPO as long as each feels confident in their own understanding of the team composition and the roles of each member.

5.2.3 Step 3) "I feel comfortable working in this team"

The third step has much to do with the boundary condition of team chemistry and cohesiveness identified by Pierce & Jussila (2010), supported by the dimension on belonging Pierce et al (2001) and context factors such as personality, receptiveness and hospitality of the target as well as language and culture background. Experiences such as feeling heard and respected, the ease of communication, mutual trust and honesty as well as commonly agreed ways of working play a big role in this step. Interpersonal relationships have a significant role as well, since most of the above mentioned experiences happen in interactions between individuals, gradually developing the feelings of trust and connection towards the whole team. Thus, each individual has the power to facilitate this step by creating strong relationships with each of the other team members.

It could be said that this step reinforces step 2, by strengthening the emotional connection of the team members towards the team and the project and guiding them to identify themselves as part of "us" that includes all the other members of the inter-organisational team. This is in line with the statement by Pierce & Jussila (2010), noting that good team chemistry is likely to make the team members more committed to the team. However, this step could not be taken without first completing step 2, since starting to feel comfortable in a team can only happen after one decides that the team and project is worthy of the emotional investment and commitment. It should be remembered that the connection between steps 2 and 3 can also work in another direction: if one starts feeling uncomfortable working in a team, they are likely to start seeing the whole project as unattractive and want to distance themselves from it, as clearly seen in the results. Furthermore, feeling comfortable working in a team seems to strengthen steps 5 and 1 as well, because it is likely to increase the team members willingness to invest themselves in the target as well as to facilitate information sharing. Since this step seems to affect three out of four other steps, its role in facilitating CPO is significant.

The role of belongingness is clearly seen in the results concerning the teams with high CPO, where each of the team members, including POs, reported feeling like a strong part of the team. What creates the sense of belongingness seems to be slightly more difficult to

pinpoint however, as many of the interviewees just saw it to "happen naturally." Simply spending enough time together as a team certainly plays a big role, increasing the familiarity and allowing the members to engage in informal interactions. This is connected to the statement by Pierce & Jussila (2010) that CPO is more likely to emerge if the team members know each other from beforehand.

While belongingness was recognised by the interviewees as an important part of strong CPO, it was mostly discussed from the case company perspective. In inter-organisational teams however, all members should be able to feel belonging, not just case company employees. In cases where the majority of the team consists of the case company employees who already know each other and have a strong sense of belonging internally, they have an especially pronounced role of making sure the client representatives and third parties feel welcome and comfortable as well. For example, all kinds of informal team activities such as team days or celebratory dinners should include all members of the inter-organisational team.

Because the case company employees and the client representatives are unlikely to know each other from beforehand, paying special attention to relationship building over organisational boundaries should form an important part of facilitating CPO in inter-organisational teams. This suggestion is in line with the previous research by Pierce & Jussila (2010), pointing out that CPO is a *collective* phenomenon and Rein & Gustafsson (2007) underlining that creating the sense of community, belonging and familiarity over organisational boundaries is crucially important in inter-organisational teams.

The above mentioned suggestion gains even more weight while turning the attention towards the issue of trust, which clearly has a significant role in feeling comfortable in a team. As lack of trust is identified to be one of the biggest challenges in inter-organisational teams (Conboy & Morgan, 2011; Johnsson, 2018; Rein & Gustafsson, 2007), trust creation should be one of the primary focus points when aiming to facilitate CPO. Many examples of teams with high CPO applied the suggestions by previous literature for trust creation, for example arranging face-to-face meetings, engaging in open and ongoing communication, arranging opportunities for informal interactions, sharing

pieces of one's personal life and engaging in reflection as a team. These seemed to have helped the team members feel psychological safety and trust towards their team members. Additionally, actively engaging in helping each other in the team also seems to have built trust in the teams. As the results show, when trust is in place between the individuals from different organisations, the perceived need for micromanaging is reduced and information sharing is improved.

While Roy (2016) points out that the leaders of self-organising teams and organisations should facilitate the trust creation, applying this suggestion in the case company context can present a challenge since the leaders of the case company (ST) are not leaders of the whole inter-organisational team. Instead, encouraging each team member to create trust with the members from the other organisations might be a better approach. Optimally, the ST could take a role of coaching the team members on how to create trust, rather than trying to do the trust creation on their behalf.

However, there seems to be an agreement between the case company representatives and the existing literature (Johnsson, 2018) that trust creation is not something one can actively do, but it takes time and requires the team to spend enough time together. One way of doing this could be involving team members from all related organisations to be part of the ideation and molding the project concept. In addition to tying the team strongly together, this would facilitate other important aspects of CPO as well, such as the ability to control the target and gaining rich information about the target.

Both of the above discussed topics, belongingness and trust, have a lot to do with familiarity. Belongingness was also often experienced as a result of similar backgrounds, hobbies or work roles, so the suggestion about creating common ground in inter-organisational teams applies to this step as well. In terms of trust creation, getting to know each other on a personal level seems to be one of the most influential routes. This is in line with the recommendation from Laloux (2016), stating that trust creation requires all the parties to bring their full selves to work. Common ground and knowledge of other member's personal life both contribute to the sense of familiarity.

Familiarity not only makes the project and the team more attractive but also seems to make the members feel more comfortable while working together. In the results, familiarity was often an enabler of more fluent and open communication and collaboration leading better results, just as suggested by Guzzo & Dickson (1996). The interviewees had several good ideas on how to increase this familiarity in the team, such as making sure the whole team spends time face to face and enabling informal communication by for example having lunch together, both of which are in line with the suggestion by Pierce & Jussila (2010). The role of cross functionality as a strengthening factor for team chemistry and cohesiveness underlined by the same authors is also clearly visible in the results. While cross-functionality is often well supported by the ways of working between the case company employees (for example code reviews), paying more attention to close collaboration with the other team members could have a positive effect on the CPO of the whole team.

According to the results, teams with strong CPO are often very active in reviewing and developing their internal ways of working, which seems to increase the cohesiveness and positively affect the collaboration. This finding is in line with the previous research by Pierce & Jussila (2010). So, while directing exact ways of working might otherwise be against the ideals of agile leaders, encouraging the teams to engage in active reflection of their ways of working is likely to do much more good than harm, as it helps the team to find and refine the ways of working that suit them, while bringing the team members emotionally closer together. In inter-organisational teams, it is especially crucial to have all of the team members take part in this collaborative reflection.

As team dynamics is something very sensitive and constantly evolving, Cohn (2018) encourages agile leaders to carefully observe it and change members of the team if needed. As seen in the results, the ST pays careful attention to this and takes action when needed. However, the ST can only affect the team composition on the case company side and most of the time has no power over other members of the team. Fortunately, as noted above, team composition is not the only aspect affecting how comfortable the individuals feel in the team. Sense of belonging, trust, psychological safety and familiarity all facilitate this step and each of them can be facilitated by the team members through their interpersonal relationships within the team.

5.2.4 Step 4) "We can do this together"

The fourth step is strongly tied to the route of being able to control the target as well as the dimension of self- and collective efficacy, both identified by Pierce et al (2001). The context factors affecting this step are target being accessible and malleable, organisational culture and job resources. The boundary condition of collective identification plays an important role here as well and as seen in the results, is crucial for building the confidence that the team can reach the agreed goals together. In other words, taking step 4 requires answers to two questions: "Do we have everything we need to succeed?" (such as autonomy, resources, information and so on) and "Who is 'we'?"

When moving from step 3 to step 4, an important mental shift must happen from the perspective of "I" to the perspective of "us." Taking the steps 2 and 3 seem to be crucially important in preparation for this, since an individual is unlikely to identify as part of "us" unless they find the team and the project attractive and interesting (step 2) and feel comfortable in being involved in the project and in the team (step 3). Jumping from step 1 ("I know what this project is about") to step 4 ("we can do this together") is likely to lead to frustration, as the team does not recognise itself as a single unit and the members are unlikely to be emotionally committed to the project. As the quantitative results show that the level of IPO is much more consistent compared to the level of CPO in the case teams, the importance of facilitating this shift from "I" to "us" is clear.

The team is only able to collectively control the target if they are given a sufficient level of autonomy from the surrounding organisations. If autonomy is limited, the team is likely to feel frustrated and discouraged, as they notice that they cannot reach the project goals via collective effort or that their efforts are not appreciated. This is in line with the previous literature, pointing out that in situations of reduced autonomy, individuals are unlikely to experience psychological ownership (Moe et al, 2008). According to the results, one of the best ways to increase the team's experience of "doing this together" is including them as early as possible in the planning of the project. The context factor of organisational culture is clearly seen in the results as well, as organisations with very hierarchical cultures seem

to be less likely to provide the team with the needed autonomy, as also noted by (Pierce et al, 2003).

As emphasised by Moe et al (2008) and clearly seen in the results, autonomy is closely connected to trust. Thus, for the team to be able to take step 4, a high level of trust from the surrounding organisations, especially the client company must be in place. So, having a high trust culture within the team (as discussed in step 3) is not sufficient in itself to allow CPO to emerge. This connection is clearly seen in the results, as many teams with low CPO had difficulty in establishing trust on the edges of the team and often felt that their autonomy is limited. The results also confirm the findings in the previous literature that trust from outside of the team is necessary to effectively use the agile ways of working inside the team. Trust creation, not only inside the team but also on its edges, should thus be one of the main areas of focus when aiming to facilitate CPO.

While the ST representatives are acutely aware of this issue and doing their best to establish trust with the client company, it seems that it cannot be done on behalf of the team. The ST seems to be aware that trust requires strong interpersonal relationships and many ST representatives are actively building their relationships with the client company representatives. However, trust between the ST and client representatives does not necessarily translate to trust between client and the team. Because of this, the main focus should be on the team members abilities and efforts in creating trust with the stakeholders in the client company. The first step to this is creating a trusting relationship with the PO, but taking in account for example the top management team or other stakeholders within the client company is likely to lead to even better results.

In addition to lack of trust, changing requirements was often mentioned as a reason for not feeling in control of the project as a team. On the other hand, self-organising literature including the Agile Manifesto by Beck et al (2001) emphasise the importance of being able to adapt to changing requirements as a key aspect of agile teams. Based on this, aiming to get rid of changing requirements entirely might thus make the teams less agile, being counterproductive. Rather, it seems that for the teams to remain with the sense of control, providing the team with information and rationale behind the changes and celebrating small successes along the way seems to be a better approach.

Because the PO works as a link between the team and the client company, he or she is in the best position in trying to gain the team as much autonomy as possible. This often requires negotiation skills and willingness to face the conflict between the team and the client company needs and wants, and requires the PO to be able to balance the needs of different parties, continuously working as a buffer and a "shock absorber" of a kind. Thus it seems that a good PO should be selfless, have excellent interpersonal skills and practise servant leadership. When aiming to affect the PO selection, these qualities should be emphasised.

As suggested by Gray et al (2010), in teams with high CPO the initial imbalance of ownership between the PO and the rest of the team was often balanced by allowing the team to influence the product concept instead of just the execution of it. Gray et al (2010) also point out that in some cases, the team attempting to influence the idea might hurt the PO's feelings or make them engage in territorial behaviour, which was seen in some of the comments regarding teams with low CPO. Based on this it seems that one of the ways the PO can facilitate development of CPO is to actively invite contributions and improvements from the team to the initial concept, helping them feel that advancing the project is a collective effort.

The importance of evening out the initially imbalanced sense of ownership between the PO and the rest of the team is also visible in the quantitative results, as in teams with high CPO the POs' experience of ownership was not stronger than the ownership among the rest of the team. When aiming to build a strong CPO for the whole team it should be kept in mind however, that the team can significantly affect the level of psychological safety the PO feels. Reflecting on the results, the PO is less likely to react negatively to the team's attempts to control the project when psychological safety and trusting working relationship is in place. Thus the case company employees should pay attention to how their own actions affect the psychological safety of the PO.

Collective identification and accepting interdependence seem to also increase the sense of control in the team through making the team members feel that although they can not fully control the project alone, they can control it as a team. Specifically, collective

identification in terms of viewing the PO as part of the team seems to make a significant difference: when the PO is truly accepted as part of the team, teams seem to feel in control and on the other hand, when the PO is not viewed as one of the team members, the rest of the team feels like they cannot fully control the project since the PO always has the last word.

The more the team members accept each other as part of the team, the more they are likely to feel that the team collectively possesses the skills and resources needed to succeed, satisfying the collective efficacy dimension. As underlined by Olckers & Du Plessis (2012), the sense of control forms an important part of self-efficacy. The crucial role of collective-efficacy for CPO is clearly present in the results, as teams with high CPO feel very confident in their skills and have clear understanding and appreciation for each other's skills. They do not fear challenges and are ready to put in extra effort, because they believe that they can achieve the goals as a team. This is in line with the findings about collective efficacy by Pierce & Jussila (2010). Furthermore, the results show that following agile processes such as Scrum or having commonly shared work history are likely to strengthen collective efficacy by increasing the knowledge and the trust in the other team members capabilities.

Lack of self- or collective efficacy on the other hand did not seem to hold back the CPO in the case company, as none of the interviewees reported feeling that they do not have the skills and capabilities to complete the tasks at hand. The few occasions that could be connected to lack of self-efficacy had to do with too tight schedules or continuously changing requirements, resulting in teams feeling overwhelmed or not in control of the project. Even in these instances however, the team members did not seem to feel that their own skills and capabilities were insufficient, but rather that the environment did not allow them to use their skills in the best ways possible. This indicates that the ST has succeeded in providing training and support in terms of practical skills. Because of this, although the ST representatives clearly feel the need to offer more support in professional development, it does not seem to be the first priority in terms of CPO.

To help a team take the step 4 "we can do this together," the ST representatives could focus on facilitating the acceptance of the PO as part of the team, promoting open

communication between all parties and encouraging the team to present their progress to the client company, all of which seem to help the team members to feel like they can succeed in the project together. Presenting the progress seems to have the added benefit of improving the visibility from the client company to what the team is doing, which is likely to reduce micromanaging and provide the team with even more control over time.

Additionally, promoting cross functionality and ways of working that increase the visibility to other team members skills and contributions is likely to strengthen the sense of collective-efficacy and through that the CPO. In inter-organisational teams, the need for this visibility is especially pronounced between the members representing different organisations. Since Verkuyten & Martinovic (2017) suggest that psychological ownership actually provides an even stronger sense of efficacy, focusing on facilitating this step might have multiplicative effects.

5.2.5 Step 5) "We are doing this together"

The final step builds around the route of investing oneself into the target identified by Pierce et al (2001), as well as the boundary conditions of interdependence and collective identification identified by Pierce & Jussila (2010). The dimension of accountability by Avey et al (2009) is also in play here, as well as the context factor of the target being visible. Collective identification and interdependence contribute to traveling down the route of collectively investing in the target, by making the investments of other team members visible. Being able to see the progress and results of the collective efforts strengthens the feeling of "we are doing this together" and thus contributes to a stronger CPO.

Being able to contribute and witnessing the contributions of others toward the project is at the core of this step. As seen in the results, in many of the high CPO teams the individuals knew each other's tasks and skill sets by heart, connecting clearly to the point by Pierce and Jussila (2010) that becoming aware of the collective investment for the project strengthens the CPO. This can be argued to be connected to fairness and peer pressure: if others are clearly working to advance the project, one is likely to do so as well. Enabling

contributions seems to be one of the most effective ways of facilitating ownership, as Pierce et al (2003) note that psychological ownership leads to willingness to contribute and make sacrifices on behalf of the target, which again strengthens the sense of ownership leading to a positively reinforcing cycle.

One of the main forms of person-to-person interactions mentioned by Pierce & Jussila (2010) as an important part of development of CPO, was helping each other. Based on the results, helping each other makes the collective contribution for the project more visible and concrete for the team members. This showed in teams with high CPO as actively offering help to others as well as asking for help without hesitation when needed. On the other hand, the willingness to help each other seemed to be stronger when the CPO was strong initially. Thus helping each other within the team and strong CPO seem to be mutually reinforcing.

As seen in the results, being part of the initiation of the project is a powerful way to collectively contribute to the project. Investment of time and ideas counts as well, not only visible contributions such as writing a piece of code or designing a layout. The sense of investing oneself seems to be stronger in teams that have gone through some challenges or major overtakings, as seen in many of the examples given by the interviewees. However, this might be a self enforcing loop as well, since teams with high CPO seem to be more likely to invest themselves and even sacrifice some of their freetime on behalf of the project.

Task interdependence clearly helps the team members feel that they are advancing the project together, as it encourages collaboration and makes other team members' contributions visible. Furthermore, it seems that different "rituals" in the agile methods help the team members recognise the collective contributions and the progress made, strengthening the feeling of "we are doing this together." Different ways of visualising the progress and collective contributions seem to also facilitate the CPO according to the results by making the contributions more concrete. Seeing the progress also seems to have a connection to step 4, more specifically collective efficacy and sense of control.

Collective accountability had a very direct connection to CPO in this context, since in several examples of teams with low CPO the individuals simply completed the tasks without giving much thought on the quality of the end result. In other words, when CPO is low, individuals might feel accountable and complete their own tasks but they are unlikely accountable for the end result. In sharp contrast, team members in teams with high CPO clearly kept themselves and others accountable for the end result, not letting anything slip the team's attention. This is closely connected to the previous literature by Avey et al (2009), emphasising that in the context of CPO, accountability is not only connected to self but the right to keep others accountable is present as well. The power of feeling accountable was shown through increased contributions which, as explained by Pierce et al (2003), strengthen CPO by enabling traveling down the route of investing oneself in the project.

In the end of the literature section it was hypothesised that the customer-vendor relationship in many of the case company projects might increase the sense of accountability, through the willingness to offer a good product to the customer. The results show however, that the more the team members see the client representatives as a customer, the less they are likely to accept them as a full part of the team. Thus, in the internal work of the team it seems that the more the customer-vendor relationship is blurred, the better. It seems that in the optimal situation the whole inter-organisational team feels accountability towards the end user of the product (usually the customers of the client company), rather than towards the client company itself.

Currently the ST clearly aims to facilitate this step by actively encouraging contributions through motivating the teams to take part in conversations with the client. While this seems to have had some effect on the team members, it is unlikely for them to actively engage in conversations unless they already feel some level of CPO. The ST could potentially facilitate the step 5 by encouraging the teams to use ways of working that make each member's contributions visible. Additionally the ST could emphasise the whole team's accountability to the end users, strengthening the sense of working together toward a common goal, rather than using language that highlights the case company employees'

accountability towards the client, which can possibly drive the team members emotionally further away from each other.

6 Conclusion

This chapter offers concluding remarks about the study at hand, highlighting the theoretical contributions and managerial implications. Limitations of the study are also discussed and suggestions for future research are presented at the end of the chapter.

This research has contributed to the understanding of the development and facilitation of CPO in self-organising, inter-organisational software development teams. While much of the findings confirm the knowledge from previous research, this study has given clarification on the requirements of CPO in this specific context and highlighted the special needs of inter-organisational teams when it comes to the development of CPO. The research has also confirmed that CPO is crucially important in this context and project teams with high CPO are likely to produce superior results compared to teams with low CPO.

The research was welcomed with open arms by all participants, agreeing that it is important to understand CPO better since it seems to play a crucial role in success of the software development projects. Furthermore, it seems that simply having a moment to stop and reflect on the topic during the interviews might already have caused some positive changes among the participants of the study, towards supporting a culture and ways of working contributing to CPO. The results show that CPO is likely to result in teams taking more responsibility, being proactive and motivated, collaborating closely, seeing the project as meaningful, putting in extra effort and persevering through challenging situations as well as decreased selfishness and decreased conflict within the team. Having strong CPO was also seen to contribute to the team members' wellbeing and to protect them from feeling excessive stress and strain. Thus it could be concluded that CPO makes the teams more effective, resilient and adaptive.

Low CPO on the other hand is likely to lead to only moderate or low results, the team not carrying full responsibility of the project, low motivation and drive, feelings of stress as well as inefficient collaboration and communication within the team and the surrounding organisations. Some interviewees raised a question whether or not it makes sense to invest

in development of CPO in all projects, since it is seen to consume plenty of team members' time and effort, possibly taking attention away from working on the project tasks. The results of this research indicate however, that the most powerful ways of developing CPO are not separate from the work itself, but that the CPO actually develops best alongside the daily work, when certain practises, attitudes and ways of working are in place.

The most important aspects in development of CPO in self-organising, inter-organisational software development teams seem to be trust, collective identification, good team spirit and open, supportive and ongoing communication. When these are in place, the rest of the mechanism affecting CPO, such as the ability to contribute to the project, are likely to be satisfied. Collective identification and good team spirit should be paid special attention to in inter-organisational teams, as development of CPO is very unlikely if all of the members from different organisations are not truly accepted as part of the team or do not feel comfortable with each other. Other significant factors are collaborative ways of working, PO capabilities, shared sense of responsibility, control and accomplishment and team composition. As a result, it seems that teams with high CPO truly enjoy working together.

The organisations surrounding the team and the communication with those play a crucial role in the possibilities of the team to develop strong CPO as well. The biggest threats to the teams' CPO here seem to be limited autonomy and lack of information. To tackle these threats, strong trust and open communication culture should be developed across organisational boundaries. On the client company side, the single biggest aspect affecting the team's CPO is the selection of the PO. In software development projects, the importance of this role cannot be sufficiently emphasised, as the PO seems to have the power to influence nearly all of the aspects of CPO in the team. It seems that quite often the PO is not aware of the expected skills and capabilities and does not fully grasp the significance of the role in terms of the team's emotions and internal dynamics. In other worlds, many POs seem to focus on management of things, when they could reach better results by focusing on leadership of people.

On the team members' individual level on the other hand, a clear understanding of one's own role in relation to the larger goals is necessary. Additionally, individuals should be

able to feel proud of their work and their values and interests should be in line with the project. Being seen as whole and feeling welcomed and appreciated also seem to play an important role, as well as the opportunities of professional development during the project. Lastly, personality traits that support collaboration and teamwork, such as being adaptive to change, having a positive mindset, helping others as well as having strong social skills are likely to contribute to the development of CPO.

The development of CPO is iterative on many levels, as many of the aspects required for CPO to develop are further strengthened when CPO increases. These are for example willingness to invest oneself and contribute to the project, proactive attitude and resilience. Thus while getting the development of CPO started might require some effort, a moderate level of CPO is likely to strengthen over time. This is a clear continuation of the previous research by Pierce et al (2003), as they point out that individual psychological ownership develops iteratively.

Because CPO is a feeling, paying close attention to the team members' feelings while aiming to facilitate CPO is necessary. As concluded in the discussion section, each of the team members should progress through the following steps for the team to develop CPO: 1) "I know what this project is about," 2) "I want to be part of this project and this team," 3) "I feel comfortable working in this team," 4) "We can do this together" and 5) "We are doing this together." In these steps, all three levels discussed in the results section are in play. The organisations on the edges of the team have power to affect how much information the members have about the project and how appealing the project seems, as well as limiting or expanding the team's autonomy and control over the project. The team itself can either facilitate or decrease information sharing, has great power over whether or not each team member feels welcome and accepted and can together build the sense of working on the project collectively. Lastly, the individual level affects what kinds of projects and teams an individual feels drawn to and what kind of interactions take place within the team.

While all interviewees agree that the ST has an important role in facilitating the CPO, the ST representatives themselves see their role as more pronounced compared to the team

members. During the projects, the ST's opportunities of directly strengthening teams' CPO seem to be limited, but supporting it indirectly through affecting the behaviour of the case company employees' is certainly possible. This approach is in line with the suggested coaching approach of leadership in self-organising environments based on the previous literature. The biggest opportunities the ST has in directly affecting CPO within the teams are related to the project initiation. These include selection of team members, including the team in the sales and planning process as well as framing of the project, the client representatives and possible third parties. It is specially important to frame the client representatives as part of the team, rather than encouraging an attitude of confrontation.

The team members themselves have great power to affect the CPO of the team and ST can indirectly affect this by encouraging the team members to carry their responsibility of the social and emotional side of the team dynamics, instead of solely focusing on the tasks. As seen in the discussion section, team members' feelings play an integral role in development of CPO and each member has the power to affect the other team members' feelings through their daily interactions. The ST can also help the team to establish ways of working that create trust and familiarity, encourage open and ongoing communication, make everyone's contributions and the project progress visible as well as facilitate continuous collective reflection within the team.

6.1 Theoretical contributions

This study has strengthened the understanding about the development of CPO and shown that many of the aspects identified by the previous literature are in play in development of CPO in self-organising, inter-organisational software development teams in the case company. Additionally, this study has provided several practical suggestions on how CPO might be facilitated in this context by the surrounding organisations and the team itself. The role of trust in development of CPO is clearly visible in the results of this research, confirming that the suggestion by Verkuyten & Martinovic (2017) that trusting an individual to care for an object satisfies all the routes affecting ownership identified by Pierce et al (2001), is valid on a collective level as well. Furthermore, the five steps identified in the discussion section highlight the importance of the team members' feelings,

instead of just actions or capabilities for the development of CPO. This acknowledgement of the five emotional steps needed for development of CPO can guide the efforts of facilitating CPO in self-organising, inter-organisational settings.

This research has provided deeper understanding of the challenges of CPO development in inter-organisational teams and found that the role of the boundary conditions identified by Pierce & Jussila (2010) are of great importance in this context. Since the results indicate that the boundary conditions are a prerequisite for satisfying the routes affecting CPO (Pierce et al, 2001), the more concrete understanding on how the fulfillment of boundary conditions can be facilitated in this context is one of the main contributions of this research to the study of CPO. The previous research by Rein & Gustafsson (2007) pointed to this direction by emphasising the importance of creating an informal and trusting environment over the organisational boundaries. Thus this research ties the previous findings in the areas of CPO and inter-organisational teams together and has identified concrete ways of facilitating the fulfillment of the boundary conditions in self-organising, inter-organisational software development teams.

6.2 Managerial implications

While aiming to facilitate CPO, managers should remember that developing CPO cannot be done on behalf of the team. Rather, managers should take a coaching approach, ensuring that each of the team members can do their part in collectively facilitating CPO. Furthermore, managers should keep in mind that CPO and the steps required to develop it are feelings, emotional experiences. As all the teams and individuals are unique, there is no fixed way of developing CPO. Since being able to contribute to the project plays a significant role in development of CPO, enabling this in all areas of the project is a powerful way to facilitate CPO. Abstract contributions are also valuable in terms of CPO, so engaging the team to find their own ways of working, conflict solving methods, ways of creating trust and reflecting over their own work as a team should be paid attention to in addition to the more concrete contributions in the form of work tasks.

As much of the CPO develops within the team and strongly depends on the team members' behaviour, the managers should pay special attention to training their employees to be skillful facilitators of CPO. In this, training the employees in the areas of in the moment awareness, collective reflection, emotional sensitivity and communication is recommended. In an optimal situation, the case company could gain a reputation of offering highly skilled professionals who, apart from their technical knowledge, truly have the capabilities and right attitude to make the collaboration in inter-organisational teams seamless and effective.

As in inter-organisational teams the work is, by definition, divided over two or more organisations, the managers should keep in mind that aiming to gain the most possible ownership to their own organisation is counterproductive. Instead, the managers should work as servant leaders for the inter-organisational team, helping them to develop CPO in the team itself. This can include facilitating the information flow between different parties, facilitating and making contributions visible, encouraging the team members to build trust and strong interpersonal relationships over organisational boundaries, framing the client and possible other parties as part of the team, encouraging collective reflection, allowing the team with sufficient autonomy and reminding the individuals that each of them has the power to affect the CPO of their team members through their own actions.

6.3 Limitations

While the research has been planned and performed carefully, the study has certain limitations. Firstly, as the research was planned and completed in collaboration with the case company, the data from the case company is richer than the data from and about the other parties due to better access. This means that some data from the other parties has likely been left uncovered. Additionally, as the research was planned and initiated with the ST representatives of the case company and represents their need for more understanding of CPO, the employees of the case company might not have shared all their thoughts and feelings openly, knowing that the results will be reviewed by the top management of the company. In some instances, different non-disclosure agreements also limited the depth in which the interviewees could describe the cases.

Secondly, the spreading of the Covid-19 pandemic limited the data collection slightly by not allowing face-to-face interactions. Due to this, all the interviews and meeting observations were performed remotely via different online meeting tools, marginally limiting the ability to read the body language and interactions. Communication online might also have made the interactions slightly more formal, since the opportunities for creating a relaxed ambiance for conversation were constrained.

Thirdly, the position of the researcher as an outsider and as a student might have affected the level of trust and openness from the interviewees' side. However, it must be mentioned that the interviewees were very collaborative and seemed genuinely interested on the topic, lending themselves for engaging interviews.

Fourth, the sampling process of the research was limited, since participants were selected on a voluntary basis. This might mean that only the people who were initially interested in the topic of CPO participated in the research and thus the more enthusiastic opinions might be overly represented. In terms of the case teams, the biased views were attempted to address by including at least two representatives from each team. The limited scope of the research also affected the number of performed interviews and the number of respondents in the quantitative survey. Due to the low number of respondents in the survey, the quantitative results are treated as rough guidelines specific for this context, rather than generalisable truths about CPO.

Fifth, as CPO is a complex concept, the limited understanding of the research topic among the research participants might have affected their answer in the survey and interviews. However, having them react and respond on an intuitive basis was seen as a more valuable choice since too much theoretical explanations might have made them less aligned with their individual experiences and led to answers that are less connected to their daily reality. Thus it was left to be the researcher's role to select the relevant pieces of data for the analysis.

Lastly, the personal biases and sensemaking process of the researcher has surely affected the results in some ways, as the results are an interpretation of the collected data. As suggested by Kallio et al (2016), systematically collected knowledge from previous literature has been used in the aim to reduce the subjective role of the researcher. Additionally, the suggestions on good data collection and analysis practices were followed, such as the usage of neutral language and body language to avoid guiding the interviewees to a specific direction. Careful and iterative thematic analysis process was also followed to allow the formation of meaningful themes without compromising the richness of the data.

6.4 Suggestions for future research

As the study at hand is a single embedded case study solely focusing on a small sample within one organisation, more research about the topic is needed with larger samples and within different organisations. Performing studies with larger sample sizes would yield more generalisable results as well as enable comparisons between on-site and remotely working teams, and between different team compositions. Deeper understanding of the development of CPO in self-organising, inter-organisational software development teams could also be gained through longitudinal studies, following the teams over time. This could give valuable information on how the team members feel on each stage of the project and how CPO could be facilitated over time.

As this study was mainly reliant on the case company for data collection, including more of the client perspective in the future research could also give valuable information on how the process of developing CPO is perceived in the wider client organisations and whether or not they have similar views on the ways of facilitating it. Additionally, similar studies could be performed in other than software development contexts, to examine whether the approach of facilitating CPO presented in this study applies to other environments as well.

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Appendices

Appendix A, examples of the interview questions from the interview guide.

Before beginning the interview, the concept of CPO was explained to the interviewees.

Questions for the ST representatives:

- Think about a team that seemed to have a strong sense of collective ownership. What kind of project was it and what did their teamwork look like?
- Think about a team that seemed to have a very low sense of collective ownership. What kind of project was it and what did their teamwork look like?
- You are part of the support team. What kind of support do you offer to the teams and individuals so that they could develop collective psychological ownership?
- Think about a team that has just started working on a new project. What could the team members do to facilitate the development of collective psychological ownership?
- Is CPO a good thing that should be aimed for within a development project? Why? Why not?

Questions for the team members:

- Tell me about your current project and the team
- Give me an example of a moment when you felt that the team had control of the direction and outcomes of the project. What made you feel this way?
- Give me and example where you and your team felt that you were not able to fully use your effort, ideas and skills for the project
- How would you describe the communication and interaction in your team?
- From your personal experience, is CPO a good thing that should be aimed for within a development project? Why? Why not?

Appendix B, examples of the survey questions

Sample Items of Psychological Ownership Measure (scale 1-6) by Avey et al (2009)

Self-Efficacy

- I am confident in my ability to contribute to my organization's success
- I am confident I can make a positive difference in this organization

Accountability

- I would challenge anyone in my organization if I thought something was done wrong
- I would not hesitate to tell my organization if I saw something that was done wrong

Sense of Place or Belongingness

- I feel I belong in this organization
- I am totally comfortable being in this organization

Self-Identity

- I feel this organization's success is my success
- I feel being a member in this organization helps define who I am

Items of Collective Psychological Ownership Measure (scale 1-7) by Pierce et al (2018)

- We (my team members and I) collectively agree that this is OUR job
- We (my team members and I) collectively feel that this job belongs to US together
- We (my team members and I) feel a very high degree of collective (team) ownership for this job
- All of the members of my work team feel as though we own this job collectively

Appendix C, examples of the codes used in qualitative data analysis
These examples include only codes that were used in both rounds of analysis under their respective themes and is by no means a comprehensive description of all the codes used. The total number of codes for the team member level of analysis was 53 and for the ST level of analysis was 65.

dynamics on the teams' edges	communication with client
	bigger picture understanding
	information sharing and acquiring
	autonomy for the team
	the kind of project
	The client company's top management team's actions
dynamics within the project team	ways of working
	team-PO relationship
	informal communication
	team spirit
	helping each other
	sense of accomplishment
team members' personal level	personalities in the team
	learning
	values
	meaningfulness
	sense of pride
	being seen as a whole

Appendix D, examples of data extracts from interview transcripts

Dynamics on the edges of the team	
Strong CPO	Weak CPO
“If the team feels that they’ve had a say, it increases the commitment to the whole project. It’s like self-made food always tastes good... Although it would not be any better, but when you’ve had a say it increases the interest”	“There had been some unclarity from the project leadership on what is wanted and in what order, which has affected us in the team and caused some frustration when... we are doing something and suddenly have to do something else, jumping from one thing to another”
”I’d say the client is good, they are reasonable and when we discuss about timeframes they understand if it takes longer or if it takes shorter so it's not too much pressure on our shoulders”	“I believe that we could have gotten more out of the team and out of the whole collaboration if the goals would have been clearer”
“Team members were trusted and they had the freedom to make decisions, so there was a strong trust towards the team members' expertise. I think that the level of trust correlates with the level of self-organising and of the collective ownership.“	“The challenge there was that we were in such a hurry, the original schedules had not yet been changed and getting the project done in time seemed completely unrealistic”
	“Even if a developer has good ideas, they are not listened to. So viewing the individuals like they were workers in a factory ‘you just do what we tell you to do, don’t think’, maybe this is what kills all of the ownership”
Dynamics in the team	
Strong CPO	Weak CPO
“there’s this kind of connection we have, we don't even need to talk that much... we are aligned somehow, we all want to go to the same direction... ...we are super different but it somehow matches, we respect each other and each other's ideas, we all want to make things work properly and we are friendly.. I don't know, I guess when you combine all of those together then it’s.. Yea, it's super nice!”	“people just take a task card from the board, do it, and move it to the “complete” state without having the understanding about what’s the big picture and how the task that I am doing contributes to that”
“in some teams there is a delightful amount of personalities who build the team spirit and belonging also outside of the work, going to play beach volley or whatever... Some are very talented in this and it surely increases the CPO because it increases the sense of openness and the willingness	“I think that sometimes we were even avoiding the PO... in addition to her, the client had hired a project manager who understood software development much better and the methodologies and everything. So with him the communication was much easier and I noticed that we were drawn to have most of the discussions with him and were contacting the PO

of people to be part of the team”	only when we had to, which was a bit absurd”
“The environment felt very safe. That everyone had the courage to suggest and do things without the others immediately questioning them, but everyone offered their support. So open, positive, supporting... Very friendly environment”	“It’s hard to feel like a team when you don’t know who will be in your team in the long run”
“we had a physical board where we moved the task cards, and on the top of the board there was the character for which we were doing the project for”	
Team members’ personal level	
Strong CPO	Weak CPO
“It was quite a big client and the visibility we could reach felt unimaginable. We hadn’t done things on this scale before, so it felt like we have to do this well, like it could be a ticket to the next league somehow”	“we did not believe in the product itself so it felt like we were working just to get paid. ..the whole idea to me, it was super silly. And the way it was trying to be profitable, was not... fair even. Of course it was legal but it was something that is not.. Yeah, in line with my values”
“Well of course (the content of the work matters), if it would be some silly features we wouldnt feel so good. But the features are very serious and helpful”	“There might have been some conflict between personalities, if someone’s personality is such that they just want to go solo then it easily becomes so that the product is not collectively owned”
“especially for the young people (it’s important) do you feel that you grow, that you learn something from what you're doing”	“If the goals and what we are doing are not in line with your own feelings then ownership will not develop”